

135

DUGAR HYDRO ELECTRIC PROJECT (500 MW)
Pangi at Killar, District Chamba, HP.

Species wise and Class wise Enumeration of trees

FRL

| Abstract of trees | | | | | | | | | |
|----------------------------------|-------------------|---------------------------------|------------------|-------------------|-------------------|----------------------|---------------------|---------------------|-------------------|
| S. No. | Local Name | Scientific Name | 0-30 (cm) | 31-60 (cm) | 61-90 (cm) | 91 - 120 (cm) | 121-150 (cm) | >150 (cm) | Total Nos. |
| 1 | Akhrot | <i>Juglans regia</i> | 47 | 50 | 28 | 2 | 0 | 0 | 127 |
| 2 | Ash/Shunu | <i>Fraxinus floribunda</i> | 98 | 55 | 3 | 0 | 0 | 0 | 156 |
| 3 | Badah/Willow | <i>Willow/Salix</i> | 956 | 40 | 0 | 0 | 0 | 0 | 996 |
| 4 | Bakharu | <i>Lonicera</i> | 105 | 6 | 0 | 0 | 0 | 0 | 111 |
| 5 | Bhujpatra | <i>Betula utilis</i> | 1 | 3 | 0 | 0 | 0 | 0 | 4 |
| 6 | Chilgoza | <i>Pinus gerardiana</i> | 626 | 272 | 27 | 13 | 0 | 0 | 938 |
| 7 | Deodar | <i>Cedus deodara</i> | 652 | 596 | 300 | 82 | 0 | 0 | 1630 |
| 8 | Fir / Spruce | <i>Pecia simithiana morinda</i> | 8 | 5 | 3 | 1 | 0 | 0 | 17 |
| 9 | Goon | <i>H c natt</i> | 469 | 423 | 107 | 41 | 0 | 0 | 1040 |
| 10 | Jammu | <i>Prunus padus</i> | 3 | 1 | 0 | 0 | 0 | 0 | 4 |
| 11 | Kail | <i>Pinus wallichiana</i> | 182 | 64 | 33 | 15 | 0 | 0 | 294 |
| 12 | Kainth | <i>Pires pisia</i> | 19 | 21 | 4 | 0 | 0 | 0 | 44 |
| 13 | Khadak | <i>Cettris australice</i> | 1038 | 525 | 55 | 6 | 0 | 0 | 1624 |
| 14 | Killar | <i>Parrotis Jacquemontiana</i> | 9724 | 36 | 1 | 0 | 0 | 0 | 9761 |
| 15 | Mandar / Mapple | <i>Acer Caesium</i> | 626 | 95 | 1 | 0 | 0 | 0 | 722 |
| 16 | Maral | <i>Almus</i> | 125 | 89 | 28 | 4 | 0 | 0 | 246 |
| 17 | Poplar/Safeda | <i>populus alba</i> | 38 | 21 | 1 | 0 | 0 | 0 | 60 |
| 18 | Payakh | <i>alnus nitida / alder</i> | 951 | 568 | 89 | 21 | 0 | 0 | 1629 |
| 19 | Pingyath | <i>Crataegus</i> | 47 | 2 | 0 | 0 | 0 | 0 | 49 |
| 20 | Robinia | <i>Robinia spedeuocacia</i> | 3 | 3 | 0 | 0 | 0 | 0 | 6 |
| 21 | Sanjal | <i>Fraxinus xynthozeloides</i> | 945 | 87 | 1 | 0 | 0 | 0 | 1033 |
| 22 | Thangi | <i>Corylus Columna</i> | 185 | 87 | 9 | 5 | 0 | 0 | 286 |
| Total Nos of trees at FRL | | | 16848 | 3049 | 690 | 190 | 0 | 0 | 20777 |


(Range Officer)
 Range Forest Officer
 Killar Forest Range
KILLAR


(Divisional Forest Officer)
 Divisional Forest Officer
 Pangi Forest Division
KILLAR

DUGAR HYDRO ELECTRIC PROJECT (500 MW)
Pangi at Killar, District Chamba, HP.

136

Species wise and Class wise Enumeration of trees

FRL - 2 M

| Abstract of trees | | | | | | | | | |
|--|-------------------|---|------------------|-------------------|-------------------|----------------------|---------------------|---------------------|-------------------|
| S. No. | Local Name | Scientific Name | 0-30 (cm) | 31-60 (cm) | 61-90 (cm) | 91 - 120 (cm) | 121-150 (cm) | >150 (cm) | Total Nos. |
| 1 | Akhrot | <i>Juglans regia</i> | 47 | 49 | 27 | 2 | 0 | 0 | 125 |
| 2 | Ash/Shunu | <i>Fraxinus floribunda</i> | 98 | 55 | 3 | 0 | 0 | 0 | 156 |
| 3 | Badah/Willow | <i>Willow/Salix</i> | 946 | 38 | 0 | 0 | 0 | 0 | 984 |
| 4 | Bakharu | <i>Lonicera</i> | 105 | 6 | 0 | 0 | 0 | 0 | 111 |
| 5 | Bhujpatra | <i>Betula utilis</i> | 1 | 3 | 0 | 0 | 0 | 0 | 4 |
| 6 | Chilgoza | <i>Pinus gerardiana</i> | 618 | 268 | 26 | 13 | 0 | 0 | 925 |
| 7 | Deodar | <i>Cedus deodara</i> | 631 | 585 | 298 | 81 | 0 | 0 | 1595 |
| 8 | Fir / Spruce | <i>Pecia simithiana</i> <i>morinda</i> | 8 | 5 | 3 | 1 | 0 | 0 | 17 |
| 9 | Goon | <i>H c natt</i> | 468 | 422 | 107 | 41 | 0 | 0 | 1038 |
| 10 | Jammu | <i>Prunus padus</i> | 3 | 1 | 0 | 0 | 0 | 0 | 4 |
| 11 | Kail | <i>Pinus wallichiana</i> | 173 | 63 | 32 | 15 | 0 | 0 | 283 |
| 12 | Kainth | <i>Pires pisia</i> | 19 | 21 | 4 | 0 | 0 | 0 | 44 |
| 13 | Khadak | <i>Cettris australice</i> | 1024 | 517 | 54 | 6 | 0 | 0 | 1601 |
| 14 | Killar | <i>Parrotis Jacquemontiana</i> | 9704 | 35 | 1 | 0 | 0 | 0 | 9740 |
| 15 | Mandar / Mapple | <i>Acer Caesium</i> | 621 | 92 | 1 | 0 | 0 | 0 | 714 |
| 16 | Maral | <i>Almus</i> | 122 | 87 | 28 | 4 | 0 | 0 | 241 |
| 17 | Poplar/Safeda | <i>populus alba</i> | 37 | 20 | 1 | 0 | 0 | 0 | 58 |
| 18 | Payakh | <i>alnus nitida / alder</i> | 932 | 557 | 87 | 21 | 0 | 0 | 1597 |
| 19 | Pingyath | <i>Crataegus</i> | 47 | 2 | 0 | 0 | 0 | 0 | 49 |
| 20 | Robinia | <i>Robinia speceuocacia</i> | 3 | 3 | 0 | 0 | 0 | 0 | 6 |
| 21 | Sanjal | <i>Fraxinus xynthozeloides</i> | 932 | 86 | 1 | 0 | 0 | 0 | 1019 |
| 22 | Thangi | <i>Corylus Columa</i> | 180 | 87 | 9 | 5 | 0 | 0 | 281 |
| Total Nos of trees at FRL - 2 M | | | 16719 | 3002 | 682 | 189 | 0 | 0 | 20592 |


(Range Officer)

Range Forest Officer
Killer Forest Range
KILLAR


(Divisional Forest Officer)
Divisional Forest Officer
Pangi Forest Division
KILLAR

DUGAR HYDRO ELECTRIC PROJECT (500 MW)
Pangi at Killar, District Chamba, HP.

137

Species wise and Class wise Enumeration of trees

FRL - 4 M

| Abstract of trees | | | | | | | | | |
|------------------------------------|-----------------|-------------------------------------|-----------|------------|------------|---------------|--------------|-----------|------------|
| S. No. | Local Name | Scientific Name | 0-30 (cm) | 31-60 (cm) | 61-90 (cm) | 91 - 120 (cm) | 121-150 (cm) | >150 (cm) | Total Nos. |
| 1 | Akhrot | <i>Juglans regia</i> | 47 | 49 | 26 | 2 | 0 | 0 | 124 |
| 2 | Ash/Shunu | <i>Fraxinus floribunda</i> | 96 | 55 | 2 | 0 | 0 | 0 | 153 |
| 3 | Badah/Willow | <i>Willow/Salix</i> | 933 | 36 | 0 | 0 | 0 | 0 | 969 |
| 4 | Bakharu | <i>Lonicera</i> | 105 | 6 | 0 | 0 | 0 | 0 | 111 |
| 5 | Bhujpatra | <i>Betula utilis</i> | 1 | 3 | 0 | 0 | 0 | 0 | 4 |
| 6 | Chilgoza | <i>Pinus gerardiana</i> | 608 | 263 | 26 | 13 | 0 | 0 | 910 |
| 7 | Deodar | <i>Cedus deodara</i> | 608 | 572 | 290 | 80 | 0 | 0 | 1550 |
| 8 | Fir / Spruce | <i>Pecia simithiana morinda</i> | 8 | 5 | 3 | 1 | 0 | 0 | 17 |
| 9 | Goon | <i>H c natt</i> | 469 | 422 | 107 | 41 | 0 | 0 | 1039 |
| 10 | Jammu | <i>Prunus padus</i> | 3 | 1 | 0 | 0 | 0 | 0 | 4 |
| 11 | Kail | <i>Pinus wallichiana</i> | 164 | 60 | 32 | 14 | 0 | 0 | 270 |
| 12 | Kainth | <i>Pires pisia</i> | 19 | 21 | 4 | 0 | 0 | 0 | 44 |
| 13 | Khadak | <i>Cettris australice</i> | 1020 | 513 | 54 | 6 | 0 | 0 | 1593 |
| 14 | Killar | <i>Parrotis Jacquemontiana</i> | 9671 | 34 | 1 | 0 | 0 | 0 | 9706 |
| 15 | Mandar / Mapple | <i>Acer Caesium</i> | 618 | 92 | 1 | 0 | 0 | 0 | 711 |
| 16 | Maral | <i>Almus</i> | 122 | 87 | 28 | 4 | 0 | 0 | 241 |
| 17 | Poplar/Safeda | <i>populus alba</i> | 37 | 19 | 1 | 0 | 0 | 0 | 57 |
| 18 | Payakh | <i>alnus nitida / alder</i> | 920 | 549 | 86 | 20 | 0 | 0 | 1575 |
| 19 | Pingyath | <i>Crataegus</i> | 47 | 2 | 0 | 0 | 0 | 0 | 49 |
| 20 | Robinia | <i>Robinia spedeuocacia</i> | 3 | 3 | 0 | 0 | 0 | 0 | 6 |
| 21 | Sanjal | <i>Fraxinus xynthozeloides</i> | 910 | 82 | 1 | 0 | 0 | 0 | 993 |
| 22 | Thangi | <i>Corylus Columna</i> | 174 | 84 | 9 | 5 | 0 | 0 | 272 |
| Total Nos of trees at FRL - 4 M | | | 16583 | 2958 | 671 | 186 | 0 | 0 | 20398 |


(Range Officer)

Range Forest Officer
Killar Forest Range
KILLAR


(Divisional Forest Officer)

Divisional Forest Officer
Pangi Forest Division
KILLAR

DUGAR HYDRO ELECTRIC PROJECT (500 MW)
Pangi at Killar, District Chamba, HP.

Total cost of trees at FRL (above 30 cm)

Abstract (Cost of trees as per Species wise and Class wise)

| S. No. | Species | III | IIA | IIB | IA | IB | IC | ID | IE | Total Trees | Total Volume | Rate (Amount in Rs. per cum) | Total Cost (in Rs.) |
|--------|-------------------|--------|--------|--------|-------|--------|--------|--------|---------------------|-------------|----------------|------------------------------|---------------------|
| 1 | Deodar | 255 | 182 | 159 | 120 | 98 | 82 | 26 | 56 | 978 | | 84683 | |
| | Volume Factor | 0.85 | 1.42 | 2.55 | 3.68 | 4.81 | 5.95 | 7.08 | 10.48 | | | | 258493163.8 |
| | Total Volume | 216.75 | 258.44 | 405.45 | 441.6 | 471.38 | 487.9 | 184.78 | 586.88 | | | | 3052.48 |
| 2 | Kail | 29 | 21 | 14 | 22 | 7 | 4 | 8 | 7 | 112 | | 56684 | |
| | Volume Factor | 0.85 | 1.42 | 2.55 | 3.68 | 4.81 | 5.95 | 7.08 | 10.48 | | | | 20326882.4 |
| | Total Volume | 24.65 | 29.82 | 35.7 | 80.96 | 33.67 | 23.8 | 56.64 | 73.36 | | | | 358.6 |
| 3 | Fir/Spruce | 3 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 9 | | 35892 | |
| | Volume Factor | 1.13 | 2.12 | 3.11 | 4.25 | 5.95 | 7.79 | 9.2 | 12.4 | | | | 1308622.32 |
| | Total Volume | 3.39 | 0 | 6.22 | 8.5 | 5.95 | 0 | 0 | 12.4 | | | | 36.46 |
| 4 | B/L | 1447 | 644 | 293 | 185 | 102 | 67 | 92 | | 2830 | | 11245 | |
| | Volume Factor | 0.68 | 1.35 | 2.14 | 3.2 | 4.39 | 4.39 | 4.39 | | | | | 47433321.65 |
| | Total Volume | 983.96 | 869.4 | 627.02 | 592 | 447.78 | 294.13 | 403.88 | | | | | 4218.17 |
| | | | | | | | | | Grand Total= | 3929 | 7665.71 | | 327561990.21 |

A. J. D.
Divisional Forest Officer
Pangi Forest Division
Killar 176323

M. M.
Range Forest Officer
Killar Forest Range
KILLAR

DUGAR HYDRO ELECTRIC PROJECT (500 MW)
Pangi at Killar, District Chamba, HP.

Total cost of trees at FRL -2 M (above 30 cm)

| Abstract (Cost of trees Species wise and Class wise) | | | | | | | | | | | | | |
|--|----------------------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------------|--------------|------------------------------|---------------------|
| S. No. | Species | III | IIA | IIB | IA | IB | IC | ID | IE | Total Trees | Total Volume | Rate (Amount in Rs. per cum) | Total Cost (in Rs.) |
| 1 | Deodar | 247 | 181 | 157 | 118 | 98 | 82 | 26 | 55 | 964 | | 84683 | 255854441.6 |
| | Volume Factor | 0.85 | 1.42 | 2.55 | 3.68 | 4.81 | 5.95 | 7.05 | 10.48 | | | | |
| | Total Volume | 209.95 | 257.02 | 400.35 | 434.24 | 471.38 | 487.9 | 184.35 | 576.4 | | 3021.32 | | |
| 2 | Kail | 29 | 21 | 13 | 21 | 7 | 4 | 8 | 7 | 110 | | 56684 | 19973741.08 |
| | Volume Factor | 0.85 | 1.42 | 2.55 | 3.68 | 4.81 | 5.95 | 7.05 | 10.48 | | | | |
| | Total Volume | 24.65 | 29.82 | 33.15 | 77.28 | 33.67 | 23.8 | 56.64 | 73.36 | | 352.37 | | |
| 3 | Fir/Spruce | 3 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 9 | | 35892 | 1308622.32 |
| | Volume Factor | 1.13 | 2.12 | 3.11 | 4.25 | 5.95 | 7.79 | 9.2 | 12.4 | | | | |
| | Total Volume | 3.39 | 0 | 6.22 | 8.5 | 5.95 | 0 | 0 | 12.4 | | 36.46 | | |
| 4 | B/L | 1426 | 634 | 289 | 183 | 100 | 66 | 92 | 2790 | | 11245 | | |
| | Volume Factor | 0.68 | 1.35 | 2.14 | 3.2 | 4.39 | 4.39 | 4.39 | | | | 46804613.7 | |
| | Total Volume | 969.68 | 855.9 | 618.46 | 585.6 | 439 | 289.74 | 403.85 | | | 4162.26 | | |
| 5 | Total cost of trees at FRL - 2 M | | | | | | | | | 3873 | 7572.41 | 323941418.66 | |

[Signature]
Divisional Forest Officer
Pangi Forest Division
KILLAR
KILLAR
Range Officer Office
KILLAR Forest Range
KILLAR

DUGAR HYDRO ELECTRIC PROJECT (500 MW)
Pangi at Killar, District Chamba, HP.

Total cost of trees at FRL - 4 M (above 30 cm)

| Abstract (Cost of trees Species wise and Class wise) | | | | | | | | | | | | | |
|--|---|--------|--------|--------|-------|--------|--------|--------|--------|-------------|--------------|------------------------------|---------------------|
| S. No. | Species | III | IIA | IIB | IA | IB | IC | ID | IE | Total Trees | Total Volume | Rate (Amount in Rs. per cum) | Total Cost (in Rs.) |
| 1 | Deodar | 237 | 180 | 155 | 115 | 97 | 78 | 26 | 54 | 942 | | 84683 | |
| | Volume Factor | 0.85 | 1.42 | 2.55 | 3.68 | 4.81 | 5.95 | 7.08 | 10.48 | | | | 250337344.1 |
| | Total Volume | 201.45 | 255.6 | 395.25 | 423.2 | 466.57 | 464.1 | 184.06 | 565.92 | | | | 2956.17 |
| | | | | | | | | | | | | | |
| 2 | Kail | 29 | 19 | 12 | 21 | 7 | 4 | 7 | 7 | 106 | | 56684 | |
| | Volume Factor | 0.85 | 1.42 | 2.55 | 3.68 | 4.81 | 5.95 | 7.08 | 10.48 | | | | 19266891.6 |
| | Total Volume | 24.65 | 26.98 | 30.6 | 77.28 | 33.67 | 23.8 | 49.56 | 73.36 | | | | 339.9 |
| | | | | | | | | | | | | | |
| 3 | Fir/Spruce | 3 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 9 | | 35892 | |
| | Volume Factor | 1.13 | 2.12 | 3.11 | 4.25 | 5.95 | 7.79 | 9.2 | 12.4 | | | | 1308622.32 |
| | Total Volume | 3.39 | 0 | 6.22 | 8.5 | 5.95 | 0 | 0 | 12.4 | | | | 36.46 |
| | | | | | | | | | | | | | |
| 4 | B/L | 1407 | 629 | 284 | 181 | 100 | 66 | 91 | 2758 | | | 11245 | |
| | Volume Factor | 0.68 | 1.35 | 2.14 | 3.2 | 4.39 | 4.39 | 4.39 | | | | | 46341769.5 |
| | Total Volume | 956.76 | 849.15 | 607.76 | 579.2 | 439 | 289.74 | 399.45 | | | | | 4121.1 |
| 5 | Total cost of trees at FRL - 4 M | | | | | | | | | 3815 | 7453.63 | | 317254627.53 |


Divisional Forest Officer
Pangi Forest Division
Killar 176323, Kullu


Range Forest Officer
Pangi Forest Range
Killar Forest Range
Killar 176323, Kullu

DUGAR HYDRO ELECTRIC PROJECT (500 MW)
Pangi at Killar, District Chamba, H.P.

Total cost of trees at FRL

| Abstract (Cost of trees Species wise and Class wise) | | | | | | | | | | | | | Total Cost (in Rs.) | |
|--|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|---------------------|------------------------------|
| S. No. | Species | V | IV | III | IIA | IIB | IA | IB | IC | ID | IE | Total Trees | Total Volume | Rate (Amount in Rs. per cum) |
| 1 | Deodar | 409 | 243 | 255 | 182 | 159 | 120 | 98 | 82 | 26 | 56 | 1630 | | 84683 |
| | Volume Factor | 0.22 | 0.28 | 0.85 | 1.42 | 2.55 | 3.68 | 4.81 | 5.95 | 7.08 | 10.48 | | | 271874771.5 |
| | Total Volume | 89.98 | 68.04 | 216.75 | 258.4 | 405.45 | 441.6 | 471.38 | 487.9 | 184.08 | 586.88 | | 3210.5 | |
| | | | | | | | | | | | | | | |
| 2 | Kail | 127 | 55 | 29 | 21 | 14 | 22 | 7 | 4 | 8 | 7 | 294 | | 56684 |
| | Volume Factor | 0.22 | 0.28 | 0.85 | 1.42 | 2.55 | 3.68 | 4.81 | 5.95 | 7.08 | 10.48 | | | 22783566.96 |
| | Total Volume | 27.94 | 15.4 | 24.65 | 29.82 | 35.7 | 80.96 | 33.67 | 23.8 | 56.64 | 73.36 | | 401.94 | |
| | | | | | | | | | | | | | | |
| 3 | Fir/Spruce | 5 | 3 | 3 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 17 | | 35892 |
| | Volume Factor | 0.22 | 0.28 | 1.13 | 2.12 | 3.11 | 4.25 | 5.95 | 7.79 | 9.2 | 12.4 | | | 1378252.8 |
| | Total Volume | 1.1 | 0.84 | 3.39 | 0 | 6.22 | 8.5 | 5.95 | 0 | 0 | 12.4 | | 38.4 | |
| | | | | | | | | | | | | | | |
| 4 | B/L | 16006 | 1447 | 644 | 293 | 185 | 102 | 67 | 92 | | | 18836 | | 11245 |
| | Volume Factor | 0.24 | 0.68 | 1.35 | 2.14 | 3.2 | 4.39 | 4.39 | 4.39 | | | | | 90630314.45 |
| | Total Volume | 3841.4 | 983.96 | 869.4 | 627.02 | 592 | 447.78 | 294.13 | 403.88 | | | 8059.61 | | |
| | | | | | | | | | | | | Grand Total = | 20777 | 11710.45 |
| | | | | | | | | | | | | | | 386666905.71 |

Chhokar
Divisional Forest Officer
Pangi Forest Range Officer
Killer 176323
KILLAR

Agarwal
Forest Officer
Range Officer
Killer Forest Range
KILLAR

140(1)

DUGAR HYDRO ELECTRIC PROJECT (500 MW)

Pangi at Killar, District Chamba, H.P.

Cost of trees as per Village wise at FRL

| Abstract | | | | |
|----------|----------------------|--------------------|---------------------|--|
| S. No. | Village | Total Nos of Trees | Total Cost (in Rs.) | |
| 1 | R F Luj | 12,784 | 11,44,60,775.02 | |
| 2 | R F Kanyun | 1,191 | 2,92,89,868.46 | |
| 3 | R F Urnu | 711 | 1,41,66,120.67 | |
| 4 | Shelli | 1,334 | 5,00,05,547.32 | |
| 5 | Hasku | 55 | 22,66,865.76 | |
| 6 | R F Chhatwani | 1,776 | 2,34,56,988.04 | |
| 7 | R F Chilkot | 1,835 | 8,13,11,925.98 | |
| 8 | R F Kalatop | 493 | 3,63,66,412.30 | |
| 9 | R F Kagal | 102 | 98,09,955.13 | |
| 10 | R F Punto | 496 | 2,55,32,447.03 | |
| | Grand Total at FRL = | 20,777 | 38,66,66,905.71 | |


 Range Forest Officer
 Range Officer
 Killar Forest Range
KILLAR


 Divisional Forest Officer
 (Divisional Forest Officer)
 Pangli Forest Division
 Killar 176323

DUGAR HYDRO ELECTRIC PROJECT
Pangi at Killar, District Chamba, H.P.

Cost of trees as per Village wise at FRL -2 M

| Abstract | | | | |
|-----------------|--------------------------------|---------------------------|----------------------------|----------------|
| S. No. | Description | Total Nos of Trees | Total Cost (in Rs.) | Remarks |
| 1 | FRL (total) | 20,777 | 38,66,66,905.71 | |
| 2 | FRL -2 (Village wise) | | | |
| 2.1 | R F Kanyun | 185 | 4,09,507.67 | |
| 2.2 | R F Urnu | | 4,40,729.17 | |
| 2.3 | Shelli | | 4,17,198.89 | |
| 2.4 | Hasku | | 26,410.04 | |
| 2.5 | R F Chhatwani | | 2,63,812.30 | |
| 2.6 | R F Chilkot | | 6,97,422.31 | |
| 2.7 | R F Kalatop | | 6,88,274.65 | |
| 2.8 | R F Kagal | | 1,55,275.47 | |
| 2.9 | R F Punto | | 13,57,005.99 | |
| 3 | Subtotal | 185 | 44,55,636.49 | |
| | Cost of Trees at FRL-2M | 20,592 | 38,22,11,269.22 | |


 Range Forest Officer
 (Range Officer) Pangi
 Killar Forest Range
KILLAR


 Divisional Forest Officer
 Pangi Forest Division
 Killar 176323

DUGAR HYDRO ELECTRIC PROJECT
Pangi at Killar, District Chamba, H.P.

Cost of trees as per Village wise at FRL -4 M

| Abstract | | | | |
|-----------------|--------------------------------|---------------------------|----------------------------|----------------|
| S. No. | Description | Total Nos of Trees | Total Cost (in Rs.) | Remarks |
| 1 | FRL (total) | 20,777 | 38,66,66,905.71 | |
| 2 | FRL -2 (Village wise) | | | |
| 2.1 | R F Kanyun | 379 | 13,43,302.36 | |
| 2.2 | R F Urnu | | 15,34,809.67 | |
| 2.3 | Shelli | | 13,59,912.33 | |
| 2.4 | Hasku | | 34,506.44 | |
| 2.5 | R F Chhatwani | | 5,98,842.74 | |
| 2.6 | R F Chilkot | | 23,27,989.71 | |
| 2.7 | R F Kalatop | | 9,63,858.15 | |
| 2.8 | R F Kagal | | 7,89,918.97 | |
| 2.9 | R F Punto | | 30,72,724.53 | |
| 3 | Subtotal | 379 | 1,20,25,864.90 | |
| | Cost of Trees at FRL-4M | 20,398 | 37,46,41,040.81 | |

Range Forest Officer
 Killar Forest Range
 KILLAR

D. C. S. S.
 Divisional Forest Officer
 Pangi Forest Division
 Killar 176323

Full Title of the Project:- Dugar Hydro Electric Project

File No.:-

Date of Proposal:-

SITE INSPECTION REPORT NOT BELOW THE RANK OF DCF/DFO

(For the Forest land to be diverted under FCA)

A proposal has been received by this office from M/s Dugar Hydro Electric Project for the diversion (under FCA-1980) of 211.842 ha of Forest land for non-forestry purpose. The subject envisages the use of Forest land for implementation of 500 MW Dugar Hydro Electric Project. The site inspection of the land involved in the proposal has been done by me on dated..18-08-2021

2. On inspection of the site, it is found that the land required by user agency is a forest land measuring 211.842 ha.

3. The requirement of forest land as proposed by User Agency in column 2 of Part-I is unavoidable and is barest minimum required for the project.

4. Whether any rare/endangered/unique species of flora and fauna found in the area. If so, the details thereof.

There is no rare/endangered/unique species of flora and fauna found in the proposed area.

5. Whether any protected archaeological/heritage site/defense establishment or any other important monument located in the area. If so, the details thereof with NOC from competent authority.

There is no protected archaeological/heritage site/defense establishment or any other important monument located in the area.

6. (a) The user agency has not violated the provision of Forest Conservation Act, 1980 and no work has been started without proper sanction.

(b) It has been found that the user agency has violated the provision of Forest (Conservation) Act, 1980 Indian Forest Act, 1927 / any other forest act. A detailed report as per para 9.1 of chapter-I, Part C of Hand Book of Forest (Conservation) Act, 1980 is attached

(Note: Whichever of the above is applicable should be shown in the bold letters)

Specifically recommended in the interest of local inhabitants of Pangi Tahsil, District Chamba, Himachal Pradesh State and Nation.

Place: Killar

Signature

Date: 18-08-2021

Name:

Sushil Guleria

Designation:

Divisional Forest Officer

Office Seal:

Divisional Forest Officer

Pangi Forest Division

Killar 176323



LOCATION MAP

Location map of Degraded Forest Area / Non forest identified for Compensatory Afforestation in lieu of the proposed diversion of 211.842 ha of Forest land for implementation Hydro Electric Project in Pangi Valley of Chamba District.

Details of degraded forest land / non forest land:-

| SN | Division | Name of RF/PF | Range | Village | Name of Area | Area | Compartiment no | Survey no |
|----|----------|---------------|--------|--------------|---------------|---------|-----------------|-------------|
| 1 | Pangi | RF | Killar | Bindrabani | Chanchalperi | 15.377 | 20 | 16/3 |
| 2 | Pangi | RF | Killar | Bindrabani | Bindrabani | 37.44 | 18 | 5 |
| 3 | Pangi | PF | Killar | Kwas | Killar Dhar | 11.06 | 4 | 855/817/331 |
| 4 | Pangi | RF | Killar | Chilkot | Chilkot 1 | 15.915 | 7 | 13/3 |
| 5 | Pangi | RF | Killar | RF Kanun | Kanun | 20.10 | 2 | 7/1 |
| 6 | Pangi | PF | Killar | Rusmus | Sural | 21.28 | 3 | 475/451 |
| 7 | Pangi | RF | Killar | RF Urnu | Urnu | 6.76 | 3 | 9/3 |
| 8 | Pangi | PF | Killar | Ghangeet | Shelli | 2.65 | 5 | 397/1 |
| 9 | Pangi | RF | Killar | RF Luj | Sansari | 2.12 | 1 | 5/1 |
| 10 | Pangi | PF | Killar | Luj | Bistow | 7.30 | 1 | 338 |
| 11 | Pangi | PF | Killar | Chacherwas | Rogy | 25.70 | 4 | 178 |
| 12 | Pangi | RF | Killar | Chilkot | Chilkot 2 | 27.35 | 7 | 13/3 |
| 13 | Pangi | PF | Killar | Tundroo | Shinkal Dhar1 | 13.36 | 7 | 298/252 |
| 14 | Pangi | PF | Killar | Dhar Shinkal | Shinkal Dhar2 | 8.99 | 2 | 1 |
| 15 | Pangi | PF | Saach | Sach | Sach Chauri 1 | 6.912 | 3 | 242 |
| 16 | Pangi | PF | Saach | Sach | Sach Chauri 2 | 15.93 | 3 | 242 |
| 17 | Pangi | RF | Killar | RF Chhatwani | Chhatwani | 26.89 | 4 | 26/11 |
| 18 | Pangi | PF | Killar | Ghangeet | Sheli DPF | 9.46 | 5 | 361/38 |
| 19 | Pangi | RF | Killar | Sidh Ka Dera | Sidh ka dera | 38.98 | 5 | 6/4 & 7/4 |
| 20 | Pangi | RF | Killar | RF Luj | Mehrote | 89.71 | 1 | 4/1 |
| 21 | Pangi | DPF | Killar | DPF Pinccho | Pinccho | 20.40 | 1 | 2 |
| | | | | | Total | 423.684 | | |

Map attached of the area to be taken for Compensatory Afforestation

Place: Killar

Date: 18-08-2021

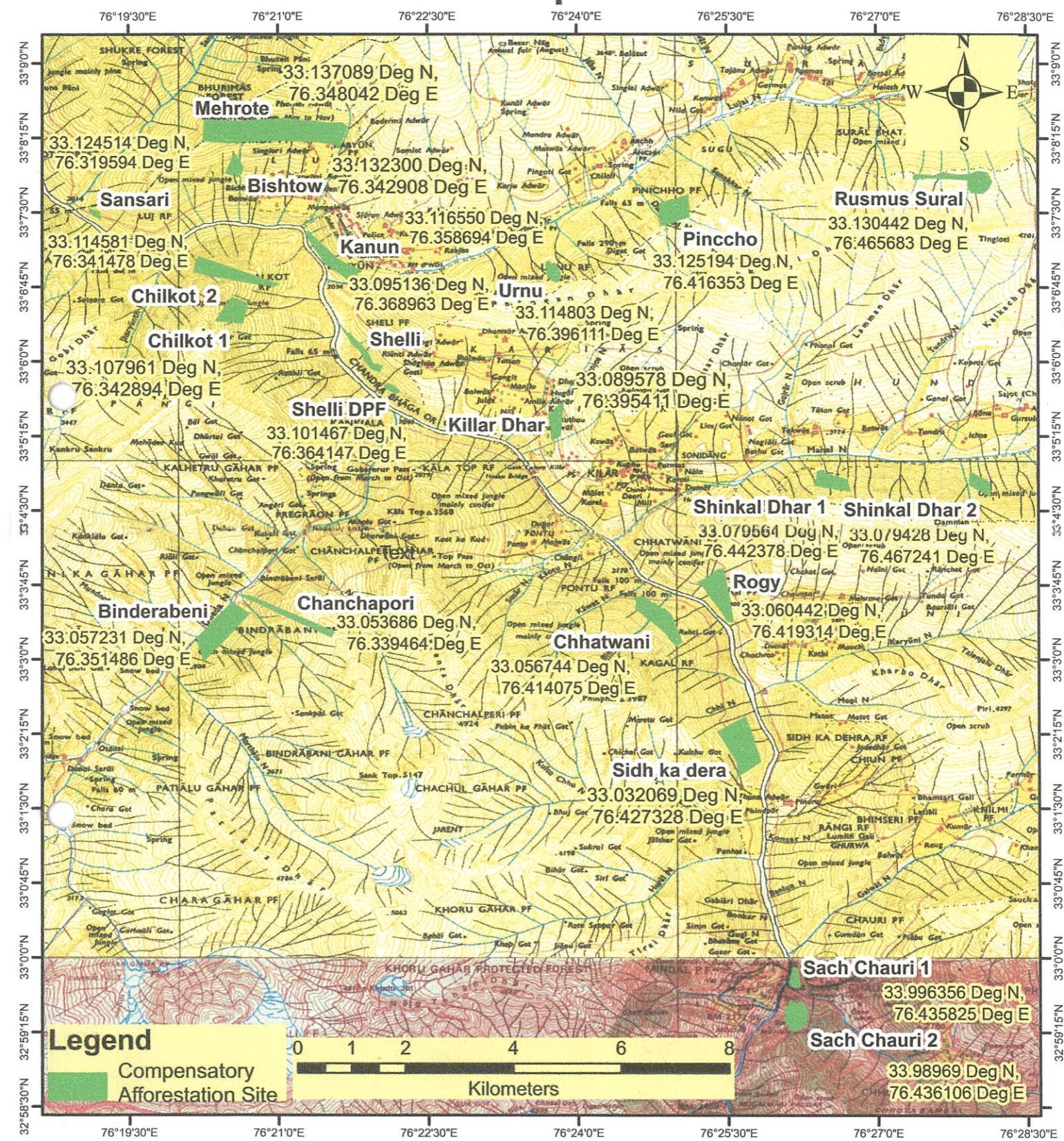

(Range Forest Officer)


(Divisional Forest Officer)

Divisional Forest Officer
Pangi Forest Division
KILLAR

Dugar HEP (500 MW) Chamba District, Himachal Prades

CA Sites Overlaid over Toposheet 52 C/8 and 52D/5

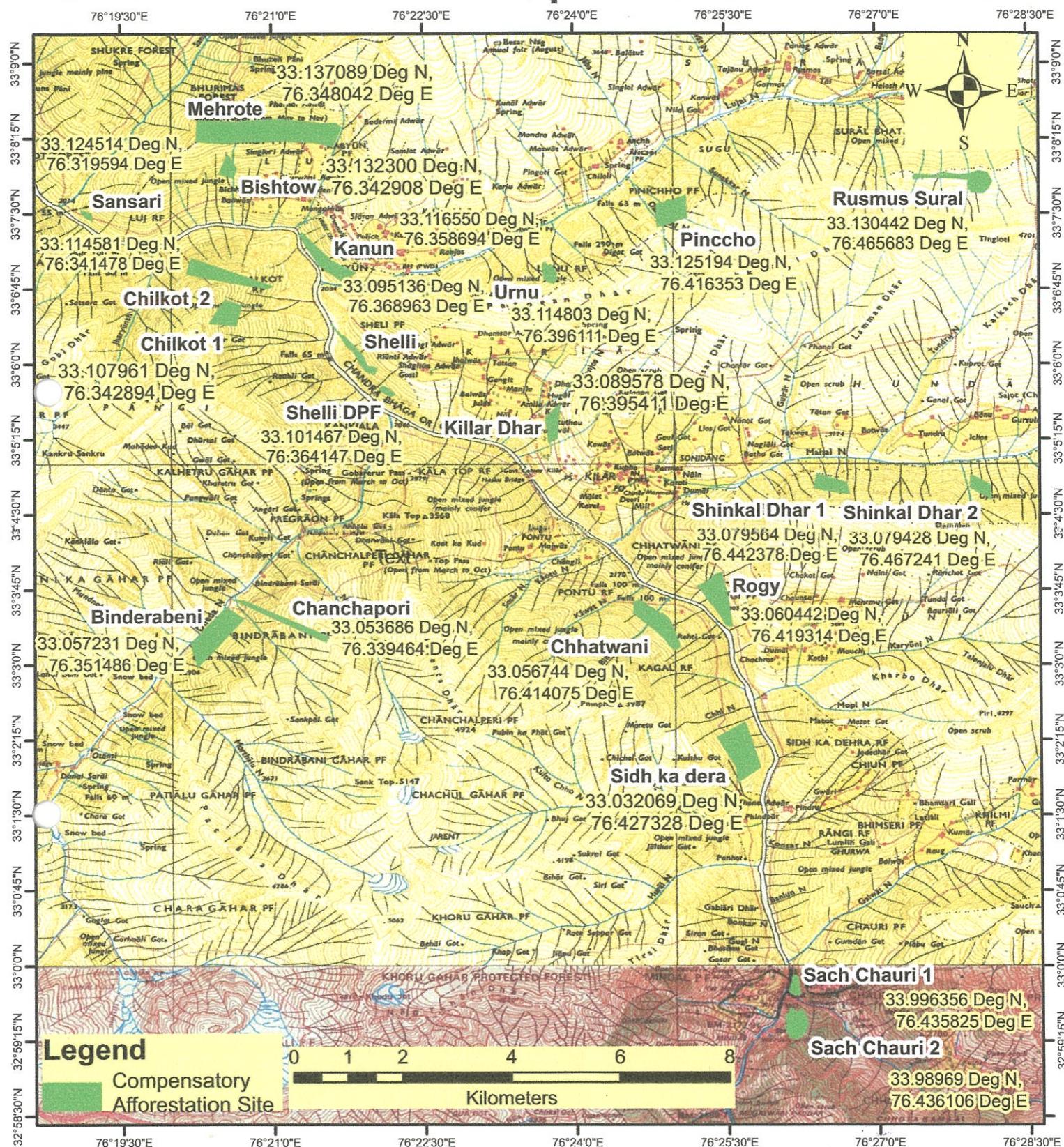


Range Forest Officer
Killar Forest Range
KILLAR

Divisional Forest Officer
Pangi Forest Division
Killar 176323

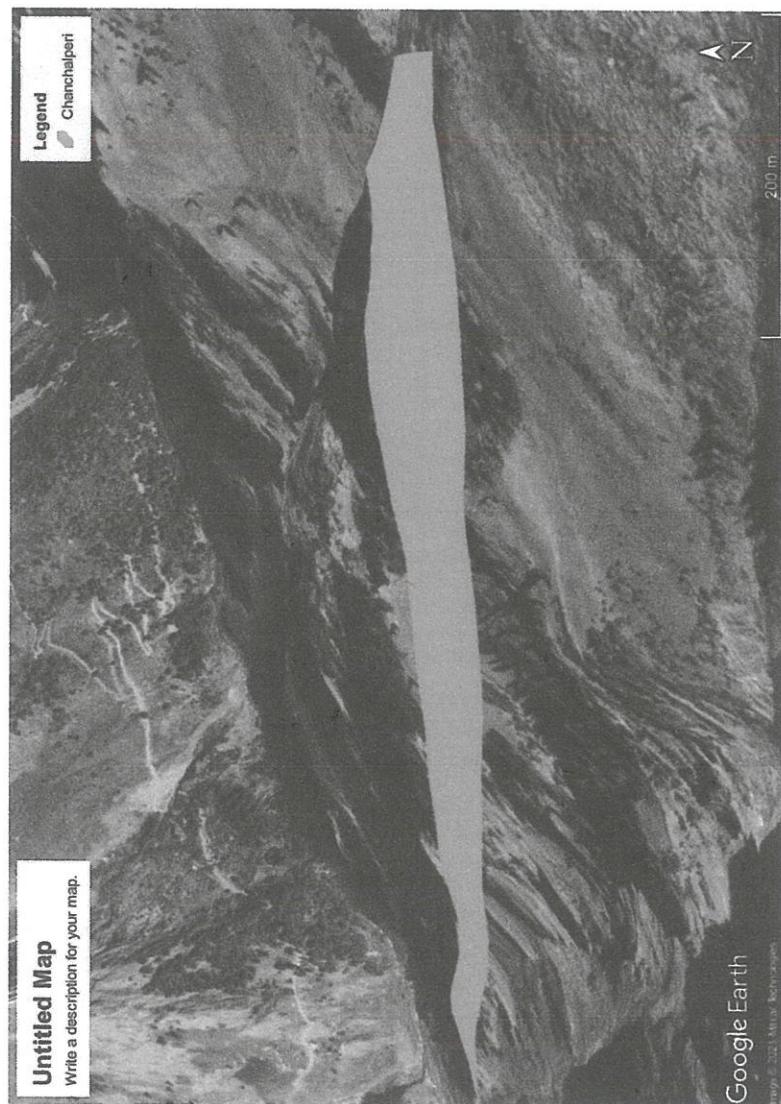
Dugar HEP (500 MW) Chamba District, Himachal Prades

CA Sites Overlaid over Toposheet 52 C/8 and 52D/5

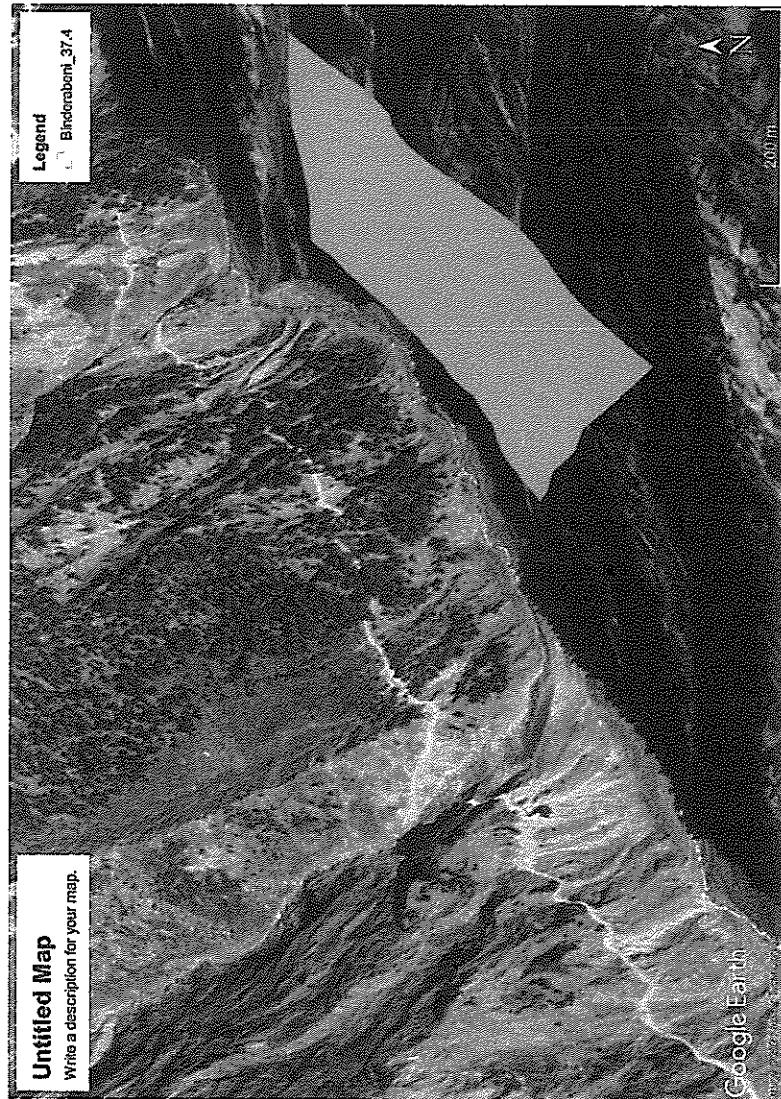


Range Forest Officer
Killar Forest Range
KILLAR

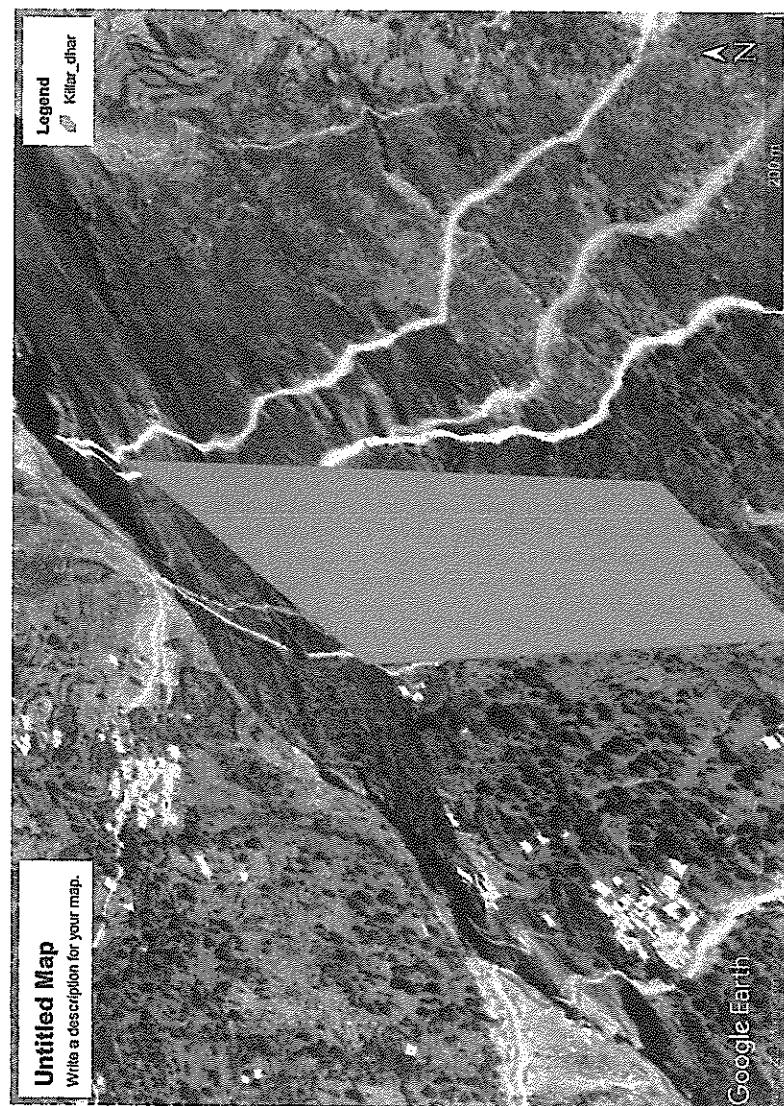
Divisional Forest Officer
Pangi Forest Division
Killar 176323



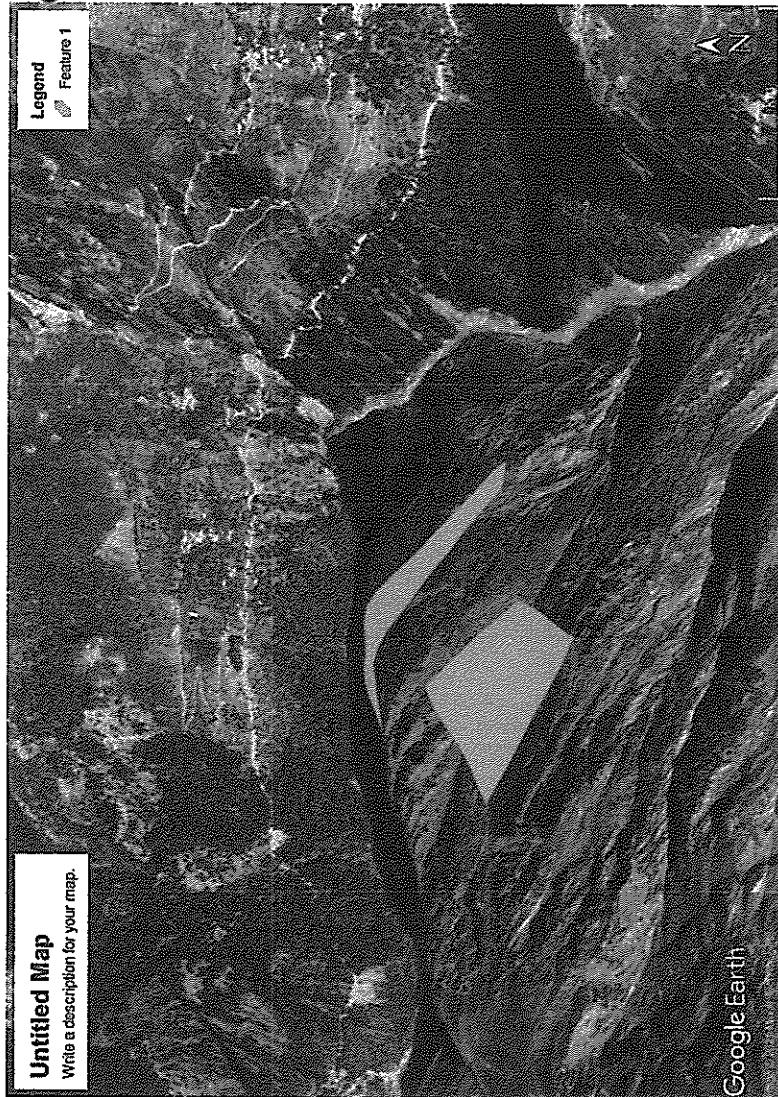

J. Deo
Divisional Forest Officer
Pangol Forest Division
KILLAR



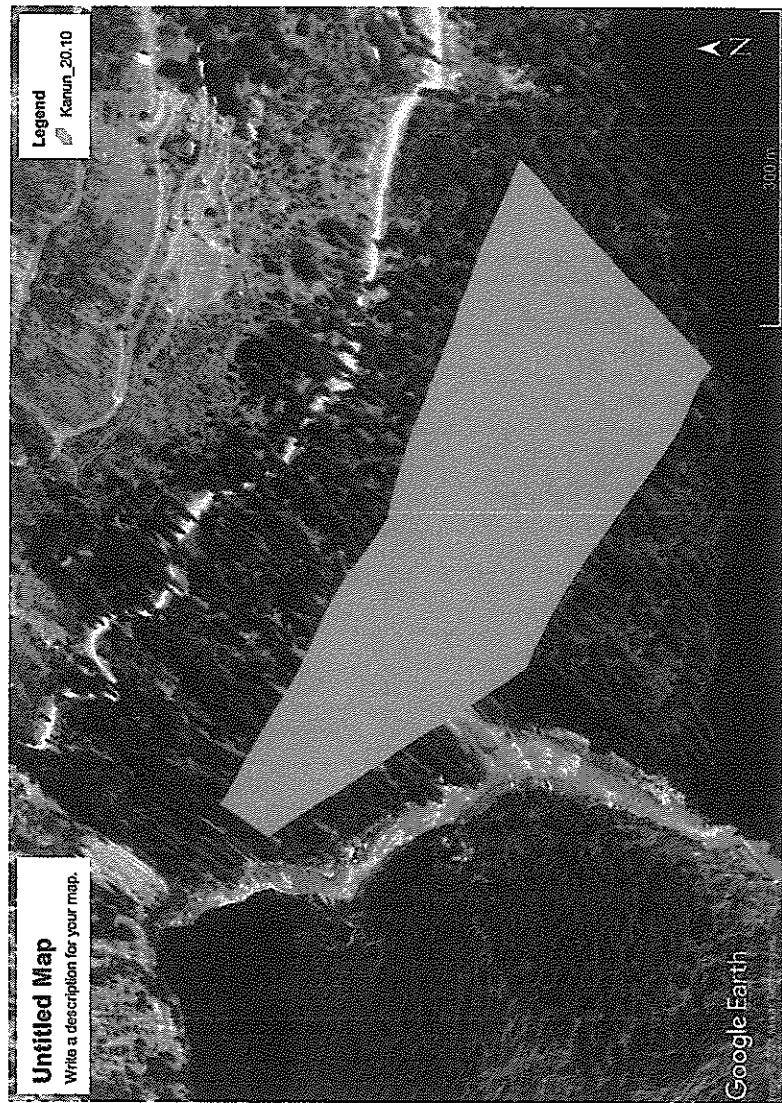
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Pangi Forest Division
KILLAR



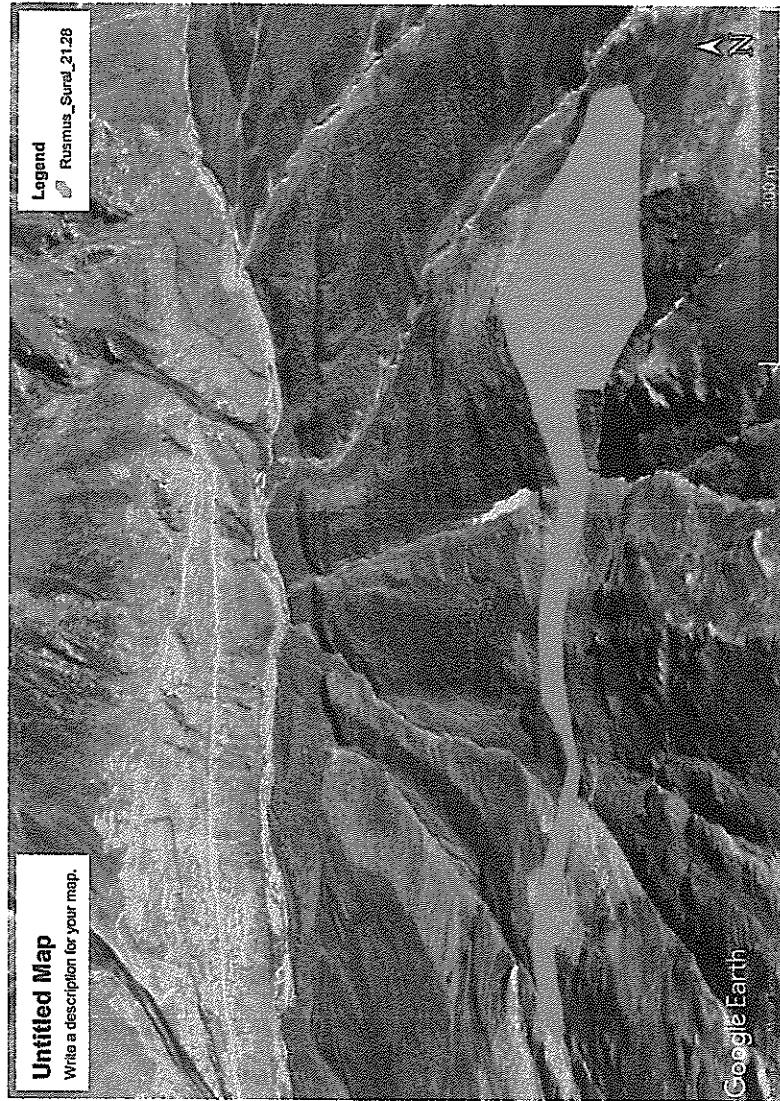
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Chilkoot 1 ~~2~~

Divisional Forest Officer
Pangi Forest Division
KILLAR

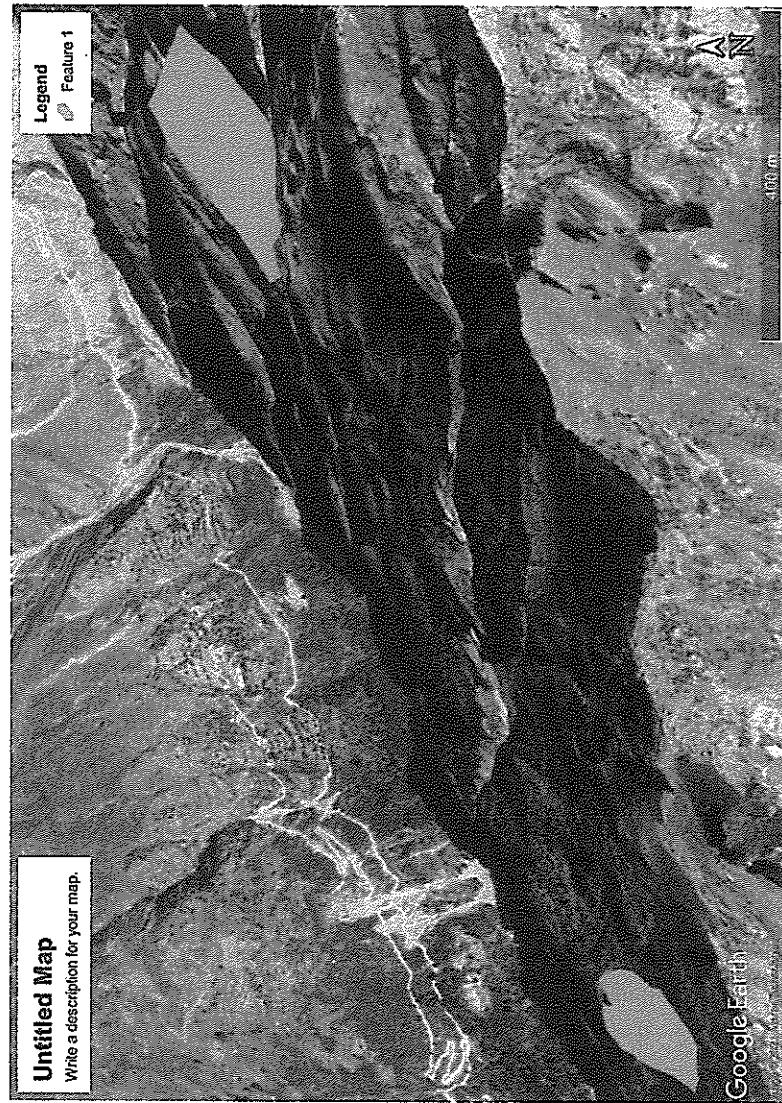


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Pangi Forest Division
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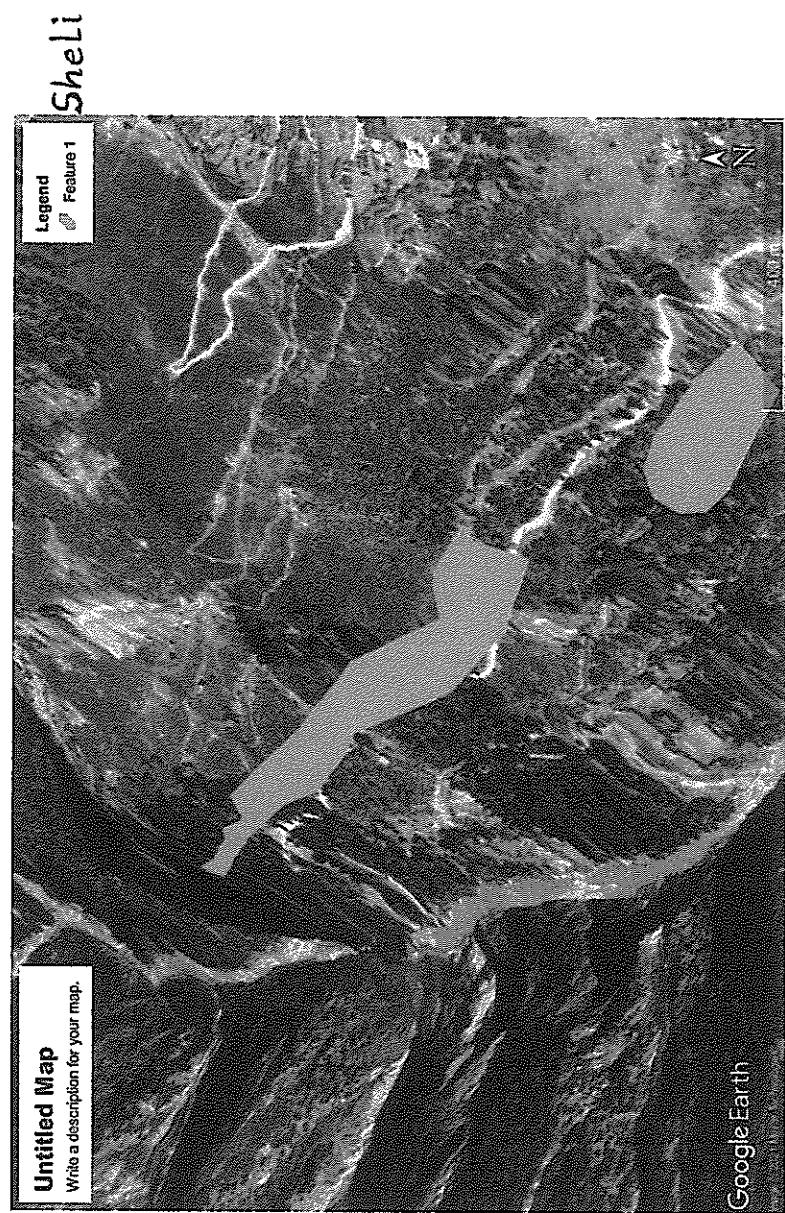



Divisional Forest Officer
Pangi Forest Division
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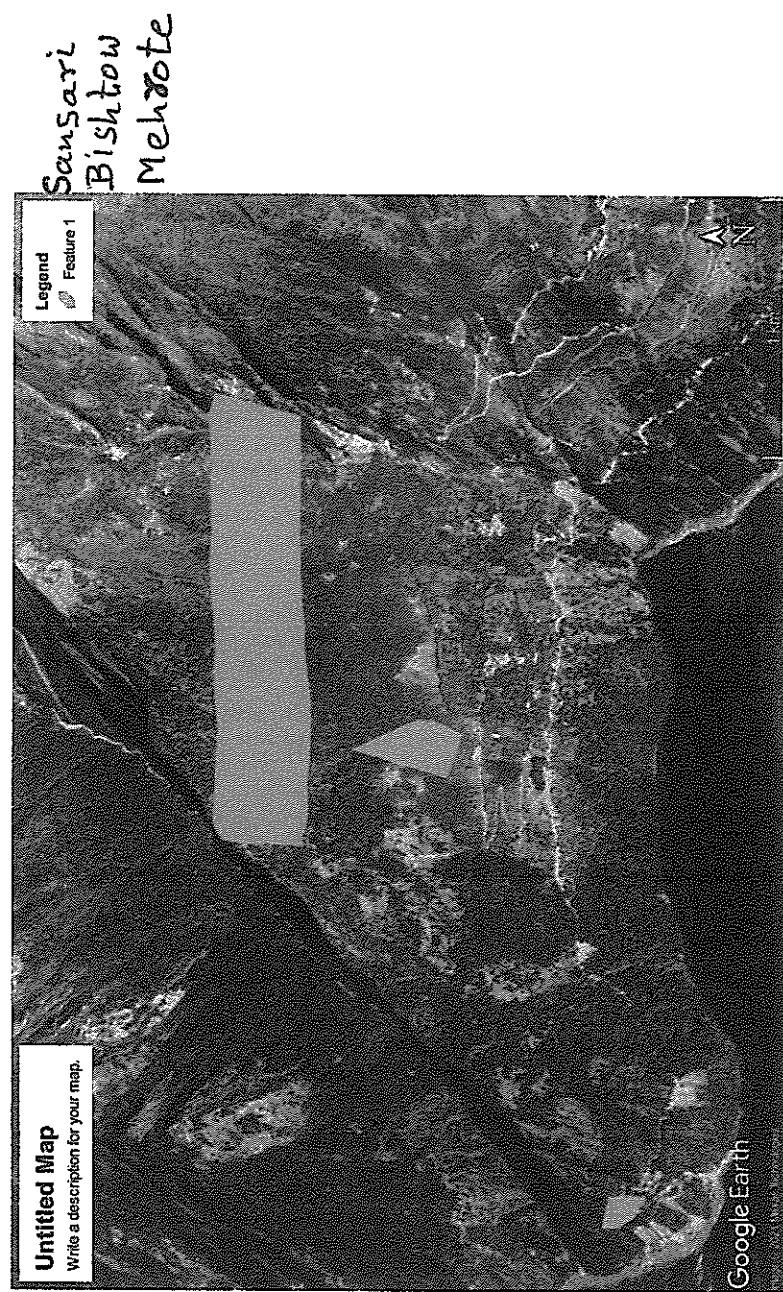
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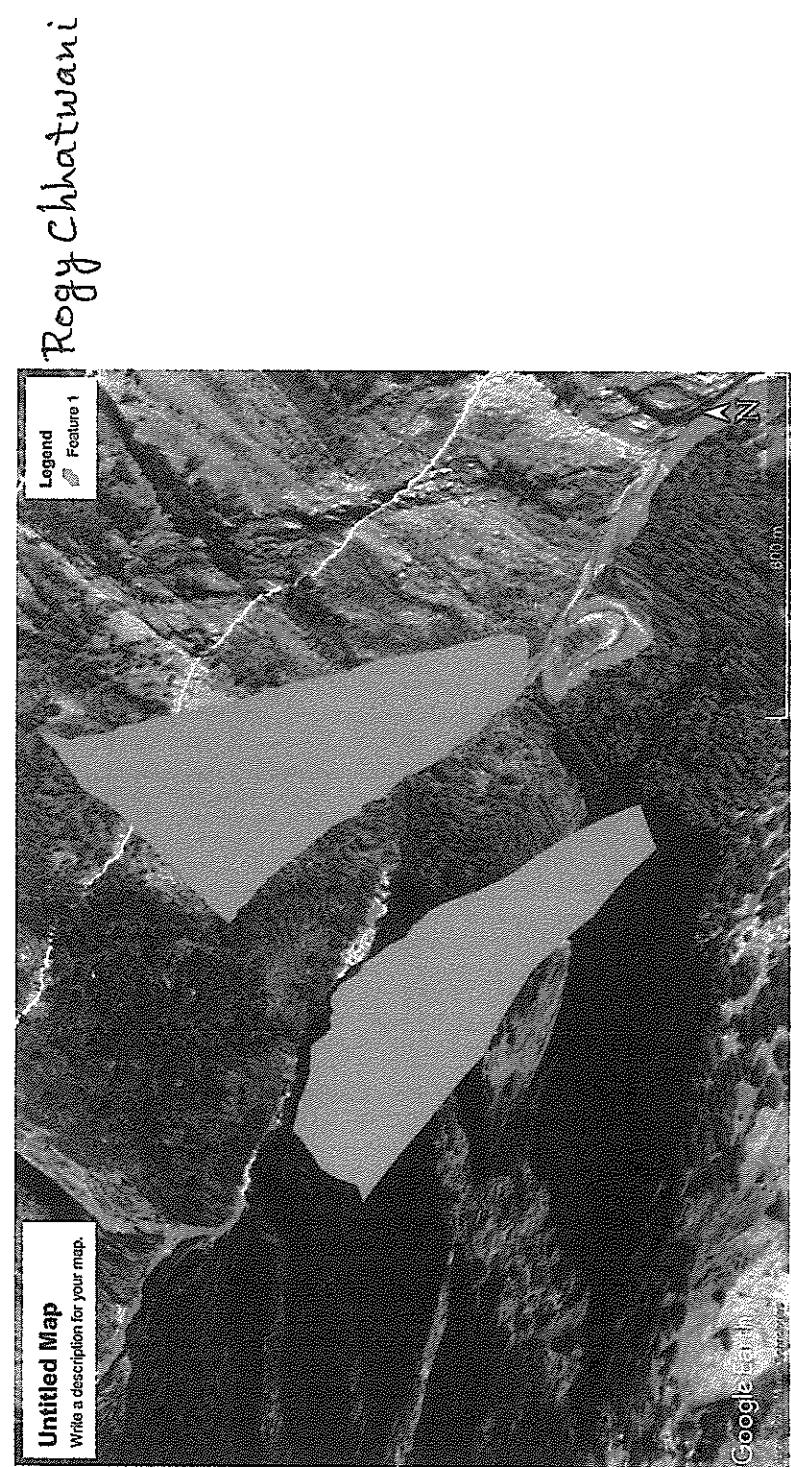
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Divisional Forest Officer
Pangi Forest Division
KILLAR



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Pangi Forest Division
KILUAR

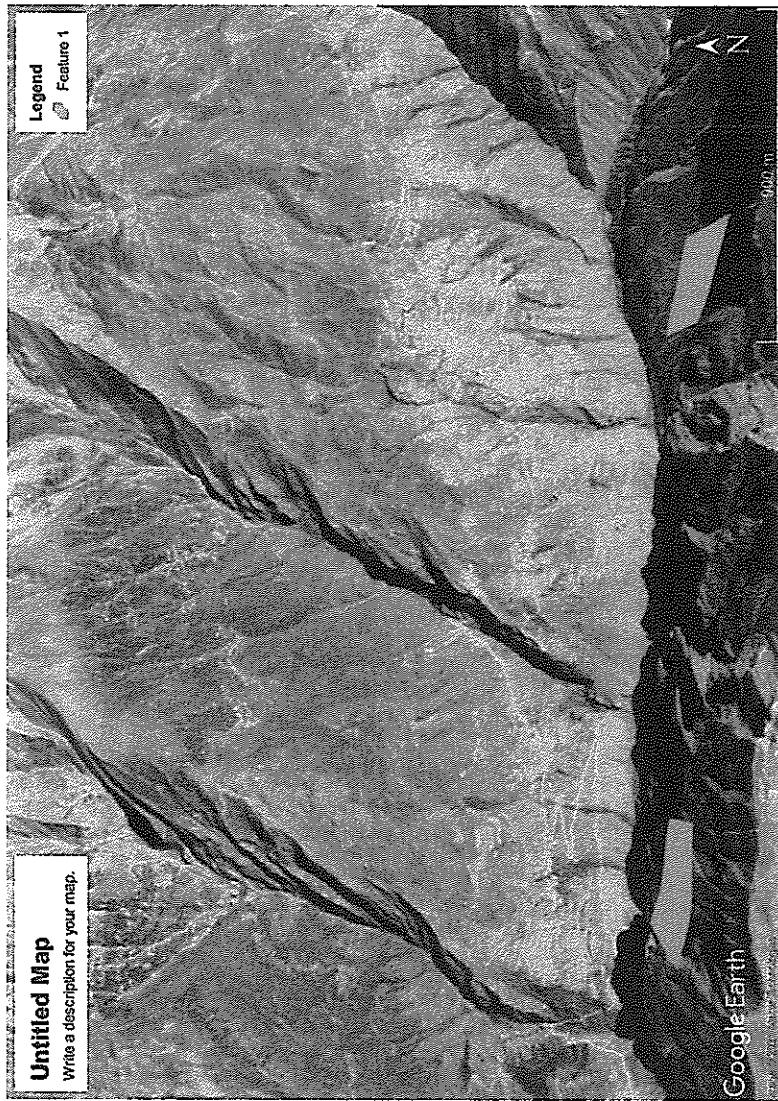


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Divisional Forest Officer
Panjal Forest Division
KULLAR



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Division Forest Officer
Pang Forest Division
KILAR

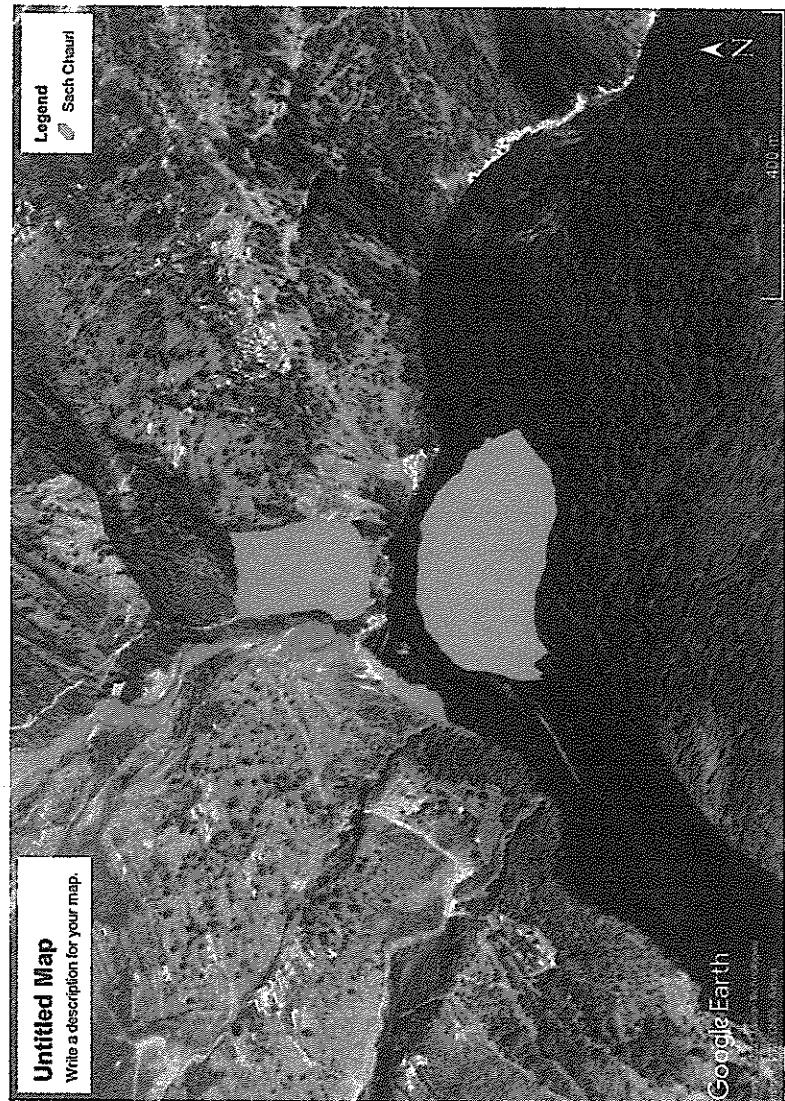
Shinkal Dhar 1 & 2.



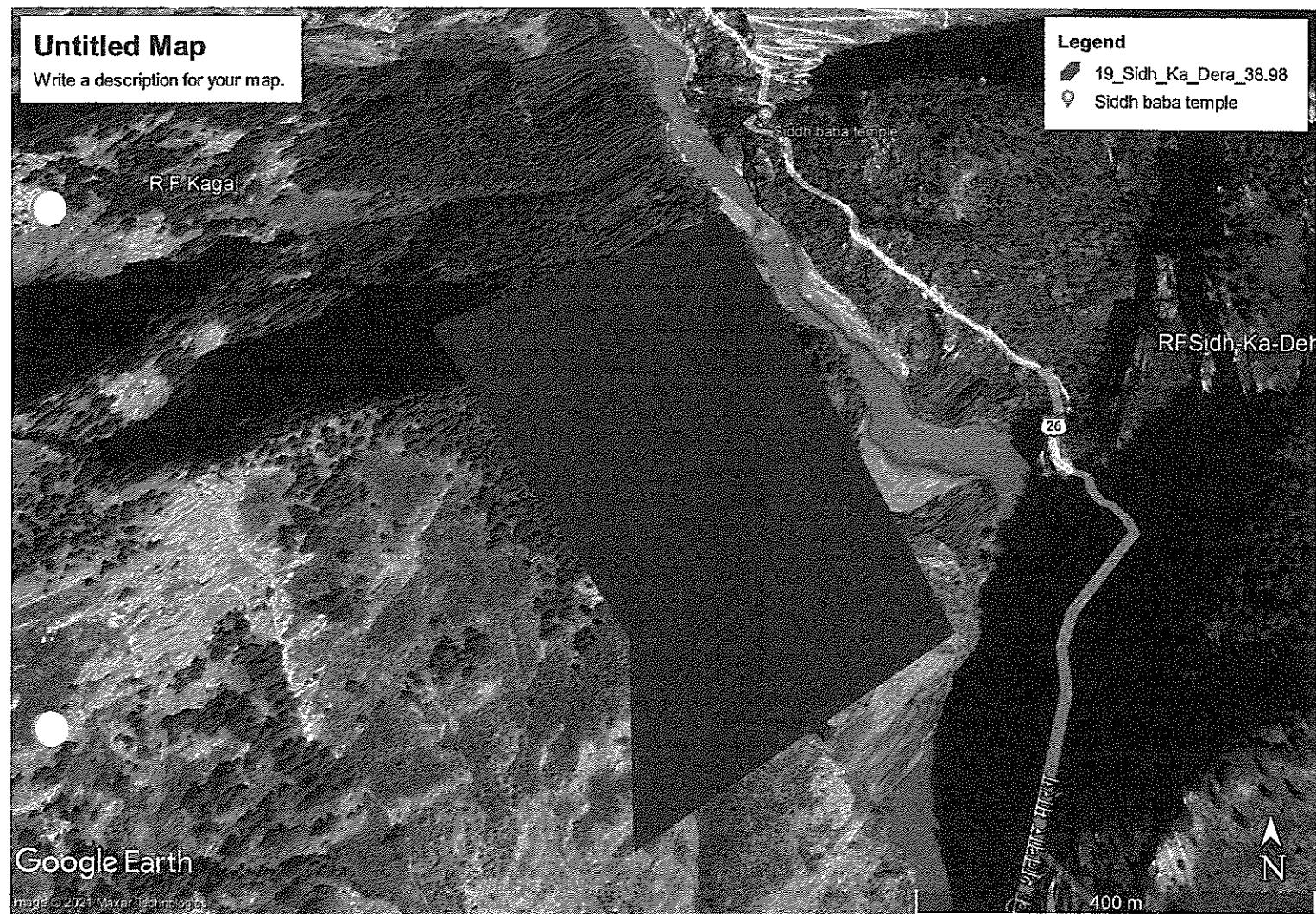
Untitled Map

Write a description for your map.

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Divisional Forest Officer
Pangi Forest Division
KILLAR



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Divisional Forest Officer
Paragi Forest Division
KILNAR



Full Title of the Project:- Dugar Hydro Electric Project

File No.:-

Date of Proposal:-

SCHEME FOR COMPENSATORY AFFORESTATION

Detailed scheme for Compensatory Afforestation to be carried out in lieu of 211.842 ha of Forest land to be diverted for Dugar Hydro Electric Project in Pangi Valley of Chamba District.

1. Details of degraded forest land / non forest land:-

| SN | Division | Name of RF/PF | Range | Village | Name of Area | Area | Compartmtn no | Survey no |
|----|----------|---------------|--------|--------------|---------------|---------|---------------|-------------|
| 1 | Pangi | RF | Killar | Bindrabani | Chanchalperi | 15.377 | 20 | 16/3 |
| 2 | Pangi | RF | Killar | Bindrabani | Bindrabani | 37.44 | 18 | 5 |
| 3 | Pangi | PF | Killar | Kwas | Killar Dhar | 11.06 | 4 | 855/817/331 |
| 4 | Pangi | RF | Killar | Chilkot | Chilkot 1 | 15.915 | 7 | 13/3 |
| 5 | Pangi | RF | Killar | RF Kanun | Kanun | 20.10 | 2 | 7/1 |
| 6 | Pangi | PF | Killar | Rusmus | Sural | 21.28 | 3 | 475/451 |
| 7 | Pangi | RF | Killar | RF Urnu | Urnu | 6.76 | 3 | 9/3 |
| 8 | Pangi | PF | Killar | Ghangeet | Shelli | 2.65 | 5 | 397/1 |
| 9 | Pangi | RF | Killar | RF Luj | Sansari | 2.12 | 1 | 5/1 |
| 10 | Pangi | PF | Killar | Luj | Bistow | 7.30 | 1 | 338 |
| 11 | Pangi | PF | Killar | Chacherwas | Rogy | 25.70 | 4 | 178 |
| 12 | Pangi | RF | Killar | Chilkot | Chilkot 2 | 27.35 | 7 | 13/3 |
| 13 | Pangi | PF | Killar | Tundroo | Shinkal Dhar1 | 13.36 | 7 | 298/252 |
| 14 | Pangi | PF | Killar | Dhar Shinkal | Shinkal Dhar2 | 8.99 | 2 | 1 |
| 15 | Pangi | PF | Saach | Sach | Sach Chauri 1 | 6.912 | 3 | 242 |
| 16 | Pangi | PF | Saach | Sach | Sach Chauri 2 | 15.93 | 3 | 242 |
| 17 | Pangi | RF | Killar | RF Chhatwani | Chhatwani | 26.89 | 4 | 26/11 |
| 18 | Pangi | PF | Killar | Ghangeet | Sheli DPF | 9.46 | 5 | 361/38 |
| 19 | Pangi | RF | Killar | Sidh Ka Dera | Sidh ka dera | 38.98 | 5 | 6/4 & 7/4 |
| 20 | Pangi | RF | Killar | RF Luj | Mehrote | 89.71 | 1 | 4/1 |
| 21 | Pangi | DPF | Killar | DPF Pinccho | Pinccho | 20.40 | 1 | 2 |
| | | | | | Total | 423.684 | | |


 (Range Forest Officer)
 Range Forest Officer
 Killar Forest Range
 KILLAR


 (Divisional Forest Officer)
 Divisional Forest Officer
 Pangi Forest Division
 Killar 176323

2. Description of the Area

| | |
|---|--|
| Whether the site selected for Compensatory Afforestation is a land bank or not | No |
| If the CA site is other than the land bank, reason to be given | The proposed sites are degraded forest land having less density. Hence, it is selected for Compensatory Afforestation. |
| In case of non-forest area identified for CA, then what is the distance of CA site from the adjoining forest boundary | Non Forest land is not available for raising Compensatory Afforestation. |
| Soil type | Sandy - Loam |
| Topography <ul style="list-style-type: none"> • Hilly /Undulating /Plain • Slope: Steep/Medium/Gentle | <p>Hilly</p> <p>Sleep</p> |
| Whether the area is bearing any root stock of vegetation | Yes, but the density is very less due to grazing pressure |

3. Plantation Model:-

Considering the 2021-2022 Plantation rate for Tribal 1, the total outlay of **Rs. Six crore Fifty One lac Thirty Nine thousand Two hundred and Ninety Eight only** would be utilized for the plantation of species in the designated Compensatory Afforestation area (Details enclosed as Annex-I).

4. Schedule of Plantation Programme

Considering the 2021-2022 Plantation and Maintenance rate for Tribal 1, the total outlay of **Rs. Twelve Crore Thirty Four Lac One hundred Four only** would be utilized for the plantation and maintenance of species in the designated Compensatory Afforestation area (Details enclosed as Annex-II).



(Range Forest Officer)
Range Forest Officer
Killer Forest Range
KILLAR



(Divisional Forest Officer)
Divisional Forest Officer
Pangi Forest Division
KILLAR

Patch wise Breakup of cost of CA scheme Plantation Model

Annex-I

| S.no | Patch No. | Name of Area | Area (ha) | Range | Rate (per ha.) for Tribal 1 for Plantation (Rs.) | Nursery cost (per ha.) | Total rate (per ha.) | Total Amount (Rs.) | Soil & Moisture Conservation works @ 25% of planting Cost | Total Amount (Rs.) |
|--------------------|-----------|----------------|-----------|--------|--|------------------------|----------------------|--------------------|---|-----------------------|
| 1 | 10 | Chanchalperi | 15.377 | Killar | 98785 | 24211 | 122996 | 1891309.00 | 472827.00 | 2364136.00 |
| 2 | 11 | Bindrabani | 37.440 | Killar | 98785 | 24211 | 122996 | 4604970.00 | 1151243.00 | 5756213.00 |
| 3 | 2 | Killar Dhar | 11.060 | Killar | 98785 | 24211 | 122996 | 1360336.00 | 340084.00 | 1700420.00 |
| 4 | 3 | Chilkot 1 | 15.915 | Killar | 98785 | 24211 | 122996 | 1957481.00 | 489370.00 | 2446851.00 |
| 5 | 12 | Kanun | 20.100 | Killar | 98785 | 24211 | 122996 | 2472220.00 | 618055.00 | 3090275.00 |
| 6 | 13 | Sural | 21.280 | Killar | 98785 | 24211 | 122996 | 2617355.00 | 654339.00 | 3271694.00 |
| 7 | 8 | Urnū | 6.760 | Killar | 98785 | 24211 | 122996 | 831453.00 | 207863.00 | 1039316.00 |
| 8 | 4 | Shelli | 2.650 | Killar | 98785 | 24211 | 122996 | 325939.00 | 81485.00 | 407424.00 |
| 9 | 5 | Sansari | 2.120 | Killar | 98785 | 24211 | 122996 | 260752.00 | 65188.00 | 325940.00 |
| 10 | 5 | Bistow | 7.300 | Killar | 98785 | 24211 | 122996 | 897871.00 | 224468.00 | 1122339.00 |
| 11 | 7 | Rogy | 25.700 | Killar | 98785 | 24211 | 122996 | 3160997.00 | 790249.00 | 3951246.00 |
| 12 | 3 | Chilkot 2 | 27.350 | Killar | 98785 | 24211 | 122996 | 3363941.00 | 840985.00 | 4204926.00 |
| 13 | 6 | Shinkal Dhar1 | 13.360 | Killar | 98785 | 24211 | 122996 | 1643227.00 | 410807.00 | 2054034.00 |
| 14 | 6 | Shinkal Dhar2 | 8.990 | Killar | 98785 | 24211 | 122996 | 1105734.00 | 276434.00 | 1382168.00 |
| 15 | 9 | Sach Chauri 1 | 6.912 | Saach | 98785 | 24211 | 122996 | 850148.00 | 212537.00 | 1062685.00 |
| 16 | 9 | Sach Chauri 2 | 15.930 | Saach | 98785 | 24211 | 122996 | 1959326.00 | 489832.00 | 2449158.00 |
| 17 | 7 | Chhatwani | 26.890 | Killar | 98785 | 24211 | 122996 | 3307362.00 | 826841.00 | 4134203.00 |
| 18 | 4 | Sheli DPF | 9.460 | Killar | 98785 | 24211 | 122996 | 1163542.00 | 290886.00 | 1454428.00 |
| 19 | 1 | Sidh ka dera | 38.980 | Killar | 98785 | 24211 | 122996 | 4794384.00 | 1198596.00 | 5992980.00 |
| 20 | 5 | Mehrote | 89.710 | Killar | 98785 | 24211 | 122996 | 11033971.00 | 2758493.00 | 13792464.00 |
| 21 | 8 | Pinccho | 20.400 | Killar | 98785 | 24211 | 122996 | 2509118.00 | 627280.00 | 3136398.00 |
| Total Area: | | 423.684 | | | | | | | | Total Cost (A) |
| | | | | | | | | | | 65139298.00 |

[Signature]

Total Area: 423.684

Range Forest Officer
Killar Forest Range
KAR

Panigrahi Forest Division
Killar Forest Division
District Forest Officer
KAR

| Patch wise Breakup of maintenance cost of 24 scheme | | | | | | | | | | | | | | Annex-II | | | | | | |
|--|--------------|------------|-------------|------------|------------|------------|-----------|-----------|-----------|-----------|------------|-----------|----------------|----------------------|------------|------------|-----------|------------|------------|-----------|
| Patch No. | | 10 | 11 | 2 | 3 | 12 | 13 | 8 | 4 | 5 | 6 | 7 | 9 | All Amount in Rupees | | | | | | |
| Name of Area | Chanchalburi | Bindabani | Killar Dhar | Chilkat 1 | Kanun | Sural | Urnu | Shulli | Sansari | Bistow | Regy | Chilkot 2 | Shinkal Dhar 1 | Sach Chauri 2 | Chhatawani | | | | | |
| Patch wise Area (ha) | 15.377 | 37.440 | 11.080 | 15.915 | 20.100 | 21.280 | 6.760 | 2.650 | 2.120 | 7.300 | 22.700 | 27.350 | 13.350 | 8.980 | 15.912 | | | | | |
| Range | Killar | Killar | Killar | Killar | Killar | Killar | Killar | Killar | Killar | Killar | Killar | Killar | Killar | Killar | Killar | | | | | |
| 1 st Year | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | 11380.00 | | | | | |
| 2 nd Year | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | 7675.00 | | | | | |
| 3 rd Year | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | | | | | |
| 4 th Year | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | | | | | |
| 5 th Year | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | | | | | |
| 6 th Year | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | | | | | |
| 7 th Year | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | | | | | |
| 8 th Year | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | | | | | |
| 9 th Year | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | | | | | |
| 10 th Year | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | 3975.00 | | | | | |
| 1 st Year | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | 7263.00 | | | | | |
| 2 nd Year | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | 4842.00 | | | | | |
| 3 rd Year | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | | | | | |
| 4 th Year | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | | | | | |
| Nursery cost (per ha) | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | | | | | |
| 7 th Year | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | | | | | |
| 8 th Year | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | | | | | |
| 9 th Year | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | | | | | |
| 10 th Year | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | 2421.00 | | | | | |
| 1 st Year | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | 18643.00 | | | | | |
| 2 nd Year | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | 12517.00 | | | | | |
| 3 rd Year | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | | | | | |
| 4 th Year | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | | | | | |
| 5 th Year | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | | | | | |
| 6 th Year | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | | | | | |
| 7 th Year | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | | | | | |
| 8 th Year | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | | | | | |
| 9 th Year | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | | | | | |
| 10 th Year | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | 6396.00 | | | | | |
| 1 st Year | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | 486835.00 | | | | | |
| 2 nd Year | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | 238466.00 | | | | | |
| 3 rd Year | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | | | | | |
| 4 th Year | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | 98351.00 | | | | | |
| Total Amount (Rs.) | 1256555.00 | 3092358.00 | 910565.00 | 1310247.00 | 1751941.00 | 5658538.00 | 218166.00 | 174539.00 | 600996.00 | 21582.10 | 2251674.00 | 109996.00 | 74919.00 | 569050.00 | 1311483.00 | 2231796.00 | 778822.00 | 3291445.00 | 7385644.00 | 167948.00 |
| B. Total of maintenance cost of CA scheme | | | | | | | | | | | | | | | | | | | | |
| A. Total of Plantation cost of CA scheme | | | | | | | | | | | | | | | | | | | | |
| Total of A+B+C | | | | | | | | | | | | | | | | | | | | |
| C: Contingencies @ 5% on (Total A+B+C) | | | | | | | | | | | | | | | | | | | | |
| D: Department charges @ 17.5% on (Total of A+B+C) | | | | | | | | | | | | | | | | | | | | |
| Total of A+B+C | | | | | | | | | | | | | | | | | | | | |
| Total of A+B+C+D | | | | | | | | | | | | | | | | | | | | |
| Total Cost : Rupees 123400/- (Rupees Twelve Crore Thirty Four Lac One Hundred Four only) | | | | | | | | | | | | | | | | | | | | |
| 1090114463.00 | | | | | | | | | | | | | | | | | | | | |
| 65122398.00 | | | | | | | | | | | | | | | | | | | | |
| 5010773.00 | | | | | | | | | | | | | | | | | | | | |
| 105027365.00 | | | | | | | | | | | | | | | | | | | | |
| 1837579.00 | | | | | | | | | | | | | | | | | | | | |
| 12407040.00 | | | | | | | | | | | | | | | | | | | | |


Forest Officer
Killing Forest Range
KILLAR


Forest Officer
Killing Forest Range
KILLAR


Forest Officer
Killing Forest Range
KILLAR


Forest Officer
Killing Forest Range
KILLAR

5. Technical Details

Technical details of compensatory afforestation scheme are as follows:

| | |
|---|--|
| General Details | Details of all the RF, DPF and dhar is to be mentioned |
| Spacement | 1100 plant per ha |
| Species | Conifer & Broad leave |
| Plantation method | Pits are to be dug 02-03 months in advance of planting to allow for weathering of soil and to improve its physical & chemical properties and planting is done in 45 cum or 30 cum pits. |
| Soil & Moisture Conservation works | For soil and water conservation works, MRI works i.e. trenches, gully plugging, vegetation measures will be carried out. The water harvesting moisture conservation trenches shall be of size 3 meters x 1 meters x 2.3 meters. The dug up earth shall be used to develop mound on the downhill side. The depth will vary from 0.2 meters on upper side to 0.3 meter on the downhill side. |
| Protection (Fencing, Watchman, People's Participation) | Barbed wire fencing in fourth strands 05 th year maintenance, participatory mode of work etc. |
| Proposed Monitoring Mechanism | As per guidelines, time to time work will be monitored by executing agency & by forest department officers while on tour. |
| Any Other Information | Due to erratic & feeble monsoon in Pangi valley, the planting in monsoon is not feasible. Therefore, planting in Pangi valley is to be carried out in late November & early December taking advantage of little rainfall which precedes the snow in valley. |

The Compensatory Afforestation will be carried out by the Forest department of Himachal Pradesh at the cost of funds to be provided by the User Agency. The work will be carried out immediately after the Government of India conveyed its approval.


 (Range Forest Officer)
 Range Forest Officer
 Killar Forest Range
 KILLAR


 (Divisional Forest Officer)
 Divisional Forest Officer
 Pangi Forest Division
 Killar 176323

Approved


 Chief Conservator of Forests (I)
 Chamba Forest Circle, Chamba (H.P.)

Brief note on Vulnerability of Forest area to erosion

Government of Himachal Pradesh has policy on Catchment area treatment of the Basin where the project proponent is liable to pay 1.5% of the project cost towards the treatment of Catchment. As the Project is of greater capacity of 500 MW, the project would contribute enormous amount towards the same. Further, the project proponent would perform the Reservoir Rim Treatment which is a part of Environment Management Plan prepared by the Project proponent. A reservoir would be formed submerging 160.45 ha of land, the reservoir spread would be extending along the river Chenab up to approx. 10.3 km stretch, the maximum width of the reservoir at FRL of 2114 m is expected to be about 200 m. The reservoir rim area is sparsely vegetated and mostly inaccessible. The upper reaches of reservoir rim can be approached via Killar, Chamba and Punto roads. The geological mapping has been carried out with particular reference to reservoir competency aspects like landslides, permeable rock beds, presence of economic minerals etc. Lithologically, the reservoir is located in massive crystalline rocks of gneisses, micaceous quartzite and schist.

In general, the valley slopes are found to be stable. In the entire mapped area only one small landslide has been found along the Killar road, located on the left bank of Mahal nala and restricted to its slide slope at FI 2250 m i.e., about 160 m above the FRI (FI 2114m) This landslide at present is fairly stable and otherwise also has no implication of any kind whatsoever on the competency of the proposed reservoir.

Therefore, the stabilized rim post its treatment and the good rock profile of the valley would pose less challenge on vulnerable of Forest area to erosion.


A. Chawla
Divisional Forest Officer
Pangi Forest Division
Killer 176323

Working Plan Prescription for the forest land proposed for diversion

The 500 MW Dugar Hydro Electric Project encompasses 211.842 ha of forest land to be diverted for construction of Hydro Power Project. The working plan prescription of the Forest Land proposed for diversion has been covered under Plantation Working Circle of Pangi Forest Division.


Divisional Forest Officer
Pangi Forest Division
Divisional Forest Officer
Pangi Forest Division
KILLAR

Full Title of the Project:- **Dugar Hydro Electric Project**

File No.:-

Date of Proposal:-

LAND SUITABILITY CERTIFICATE BY THE DFO

This is to certify that 423.684 ha land bearing the following details identified for Compensatory Afforestation in Pangi Valley of Chamba District is suitable for undertaking plantation from the management point of view and is free from all sorts of encumbrances and encroachments.

| SN | Division | Name of RF/ PF | Range | Village | Name of Area | Area | Density | Compartme nt no | Survey no |
|----|----------|----------------|--------|--------------|---------------|---------|---------|-----------------|-------------|
| 1 | Pangi | RF | Killar | Bindrabani | Chanchalperi | 15.377 | 0.2 | 20 | 16/3 |
| 2 | Pangi | RF | Killar | Bindrabani | Bindrabani | 37.44 | 0.4 | 18 | 5 |
| 3 | Pangi | PF | Killar | Kwas | Killar Dhar | 11.06 | 0.3 | 4 | 855/817/331 |
| 4 | Pangi | RF | Killar | Chilkot | Chilkot 1 | 15.915 | 0.3 | 7 | 13/3 |
| 5 | Pangi | RF | Killar | RF Kanun | Kanun | 20.10 | 0.2 | 2 | 7/1 |
| 6 | Pangi | PF | Killar | Rusmuis | Sural | 21.28 | 0.1 | 3 | 475/451 |
| 7 | Pangi | RF | Killar | RF Urnu | Urnu | 6.76 | 0.2 | 3 | 9/3 |
| 8 | Pangi | PF | Killar | Ghangeet | Shelli | 2.65 | 0.2 | 5 | 397/1 |
| 9 | Pangi | RF | Killar | RF Luj | Sansari | 2.12 | 0.2 | 1 | 5/1 |
| 10 | Pangi | PF | Killar | Luj | Bistow | 7.30 | 0.3 | 1 | 338 |
| 11 | Pangi | PF | Killar | Chacherwas | Rogy | 25.70 | 0.2 | 4 | 178 |
| 12 | Pangi | RF | Killar | Chilkot | Chilkot 2 | 27.35 | 0.4 | 7 | 13/3 |
| 13 | Pangi | PF | Killar | Tundroo | Shinkal Dhar1 | 13.36 | 0.4 | 7 | 298/252 |
| 14 | Pangi | PF | Killar | Dhar Shinkal | Shinkal Dhar2 | 8.99 | 0.2 | 2 | 1 |
| 15 | Pangi | PF | Saach | Sach | Sach Chauri 1 | 6.912 | 0.2 | 3 | 242 |
| 16 | Pangi | PF | Saach | Sach | Sach Chauri 2 | 15.93 | 0.2 | 3 | 242 |
| 17 | Pangi | RF | Killar | RF Chhatwani | Chhatwani | 26.89 | 0.2 | 4 | 26/11 |
| 18 | Pangi | PF | Killar | Ghangeet | Sheli DPF | 9.46 | 0.3 | 5 | 361/38 |
| 19 | Pangi | RF | Killar | Sidh Ka Dera | Sidh ka dera | 38.98 | 0.2 | 5 | 6/4 & 7/4 |
| 20 | Pangi | RF | Killar | RF Luj | Mehrote | 89.71 | 0.3 | 1 | 4/1 |
| 21 | Pangi | DPF | Killar | DPF Pinccho | Pinccho | 20.40 | 0.3 | 1 | 2 |
| | | | | | Total | 423.684 | | | |

Place: *Killar*

Date: *19-04-2022.*

Maran

(Range Forest Officer)
Range Forest Officer
Killar Forest Range
KILLAR

[Signature]
(Divisional Forest Officer)
Divisional Forest Officer
Pangi Forest Division
KILLAR

Full Title of the Project:- Dugar Hydro Electric Project

File No.:-

Date of Proposal:-

NET PRESENT VALUE OF FOREST LAND

Construction of 500 MW Dugar Hydro Electric Project in Pangi Valley under Forest Conservation Act, 1980

State : Himachal Pradesh

District : Chamba

Division : Pangi Forest Division

NPV CALCULATION DETAILS

| | |
|--|--|
| Area of Forest Land Proposed for Diversion (ha) | 211.842 |
| Classification of Forest Land | Eco Class VI |
| Rate for Eco value for Class VI – Very Dense Forest (Rs.) | 15,16,230/- |
| Rate for Eco value for Class VI – Dense Forest (Rs.) | 13,72,410/- |
| Rate for Eco value for Class VI – Open Forest (Rs.) | 10,69,470/- |
| Area of Forest land under Very Dense Category (ha) | 200.542 |
| Area of Forest land under Open Category (ha) | 11.30 |
| Net Present Value of Forest land proposed for diversion of non-forestry purpose (Rs.) | <p>(i) $15,16,230 \times 200.542$ $= 30,40,67,797/-$</p> <p>(ii) $10,69,470 \times 11.30$ $= 1,20,85,011/-$</p> <p>Total = 31,61,52,808/-</p> |
| Rupees Thirty One Crore Sixty One lac Fifty Two thousand and Eight hundred Eight only | |


(Range Forest Officer)
 Range Forest Officer
 Killar Forest Range
 KILLAR


(Divisional Forest Officer)
 Divisional Forest Officer
 Pangi Forest Division
 KILLAR

Recommendation Regarding Proposed Dugar Hydro Electric Project (500MW) in Pangi Forest Division, Himachal Pradesh by Divisional Forest Officer Pangi Forest Division, Killar.

Recommended in the interest of local inhabitants of Pangi Valley, State and Nation.

However 3929 Nos of trees above 30 cm at FRL of different species and class are involved. But the Compensatory Afforestation $211.842 \times 2 = 423.68$ ha is proposed amounting to Rs. 12,34,00,104/- (Rupees Twelve crore Thirty Four lac One hundred Four only) as well as the Net Present Value amounting to Rs. 31,61,52,808/- (Rupees Thirty One Crore Sixty One lac Fifty Two thousand and Eight hundred Eight only) is calculated.

Place: Killar

Date: 16/4/22


Divisional Forest Officer,
Pangi Forest Division, Killar.
Divisional Forest Officer
Pangi Forest Division, Killar.
KILLAR

Status of Environment Clearance

MOEF&CC vide its letter No.J- 12011/08/2020-IA-I dated 05.08.2020 has conveyed the accord of a fresh TOR in the name of NHPC for carrying out EIA &EMP Study of Dugar HEP. Further, MOEF&CC vide its letter No.J- 12011/08/2020-IA-I dated 08.02.2021 has conveyed the amendment in TOR for revised installed capacity from 449 MW to 500 MW. EIA /EMP Study is under progress. Environmental Clearance (EC) application will be submitted after completion of EIA/EMP Study and Conducting Public Hearing.



**General Manager
Dugar HE Project.**

महाप्रबंधक

General Manager

दुगर जल विद्युत परियोजना

Dugar Hydro Electric Project

नगवाई, जिला मण्डी (हिम.)-175121

Nagwain, Distt. Mandi (H.P.)-175121

F. No. J-12011/08/2020-IA.I

Government of India

Ministry of Environment, Forests and Climate Change
(IA Division)



2nd Floor, Vayu Block,
Indira Paryavaran Bhawan,
Jor Bagh Road, Aliganj,
New Delhi-110 003.

Dated: 08th February, 2021

To,

The Executive Director (EDM)
NHPC Ltd.
NHPC Office Complex, Sector-33,
Faridabad - 121 003, Haryana

**Sub: Dugar Hydroelectric Project in Chamba District of Himachal Pradesh –
Amendment of ToR - reg.**

Sir,

This is with reference to your Proposal No. IA/HP/RIV/184065/2020 & letter No. NHPC/ Env.&EDM/2015/8260 dated 11.11.2020 on the above mentioned subject.

2. The said proposal was appraised by the Environment Appraisal Committee (EAC) for River Valley and Hydro Electric Power Projects (RV&HEP) in its 4th meeting held on 02.12.2020. The comments and observations of EAC may be seen in the minutes of the meeting, available on the Ministry's website.

3. Project proponent (PP) informed that Dugar Hydro Electric Project is located in Pangi valley of Chamba district of Himachal Pradesh is a run-of-river scheme for utilizing the flow of Chenab River to harness the head created by constructing a 128 m high (from deepest foundation) concrete gravity dam near Luj village with FRL of EL 2114.00 m a.s.l. To harness the environmental flow during lean season, non-lean non-monsoon season and monsoon season, auxiliary plant of total 88 MW are housed in the power house cavern. Therefore, the total capacity of plant shall be 500MW (Main plant 412 MW + Aux. Plant 88 MW). The catchment and submergence area at Dam site are 7823 km² and 160.45 ha, respectively. The updated DPR of Project has been submitted by NHPC to CEA on 25.11.2020.

4. Project Proponent informed that earlier, the project was accorded ToR vide dated 05.08.2020 with 449 MW installed capacity. During examination of the revised DPR Chapter on Power Potential Studies, the installed capacity has changed from earlier vetted 449 MW (main plant 380 MW + Aux. Plant 69 MW) to 500 MW (Main Plant 412, Aux. Plant 88MW). There is no change in other important project parameters like Dam height, FRL, Submergence area, total land requirement etc. Therefore, Project Proponent requested for an amendment in ToR granted vide Ministry letter dated 05.08.2020.

5. The comparative statement with reference to earlier proposal and revised proposal is as under:

9-2 Dm

| Sl No | Details | Original | Revised |
|-------|--|---------------------------------|--|
| 1. | Proposal for fresh TOR to Dugar Hydroelectric Project in Himachal Pradesh submitted by NHPC Limited. | 449MW(Main Plant 380 MW +69 MW) | 500MW (Main Plant 412 MW + Aux. Plant 88 MW) |
| 2. | There is no change in other important project parameters like Dam Height, FRL, Submergence area etc. | | |

6. Project Proponent made the detailed presentation before the EAC in its 4th meeting held on 02.12.2020 for ToR amendment proposal. EAC after detailed deliberations on the information submitted and as presented, **recommended the proposal for an amendment** in the granted ToR i.e. change in the installation capacity from earlier vetted 449 MW (main plant 380MW + Aux. Plant 69 MW) to 500MW (Main Plant 412, Aux. Plant 88MW).

7. Above proposal was again referred to EAC in its 6th meeting held on 20.01.2021 for deliberation in terms of recommendation of the Chenab River basin study. EAC recommended the proposal for amendment (change in installation capacity from 449 MW to 500 MW only) however, the EIA study should be undertaken in accordance with recommendations of the Chenab river basin study and the project parameters/salient features of the project such as Dam height, FRL, Submergence area, total land requirement, e-flow etc. as discussed/deliberated during the Chenab river basin study should remain unchanged.

8. Based on the recommendation of the EAC, Ministry of Environment, Forest and Climate Change, hereby accords an amendment in the Terms of Reference (ToR) to the proposed revised proposal for Dugar Hydroelectric Project (500 MW) in Chamba, Himachal Pradesh.

9. Also, you are advised to prepare the EIA/EMP report following Terms of Reference granted vide Ministry letter dated 5.08.2020 and shall be submitted to the Ministry within the ToR validity period. *"The EIA study should be undertaken in accordance with recommendations of the Chenab river basin study and the project parameters/salient features of the project such as Dam height, FRL, Submergence area, total land requirement, e-flow etc. as discussed/deliberated during the Chenab river basin study should remain unchanged".*

10. Further, Ministry in suppression of OM dated 1st May 2018 regarding CER has issued an another OM dated 30.09.2020 (enclosed). In this regard, it is advised that issues raised during Public hearing and activities proposed to address such issues shall be made part of EMP.

11. This issue with the approval of the Competent Authority.

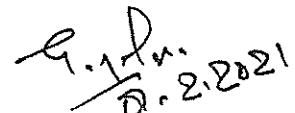
Yours faithfully,

*8-1-2021
8-2-2021*

(Yogendra Pal Singh)
Scientist 'E' Email:
- yogendra@brijnet.in
Telefax: - 011-24695365

Copy to:

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi - 110 001.
2. The Secretary, Ministry of Water Resources, RD & GR, Shram Shakti Bhawan, Rafi Marg, New Delhi - 110 001.
3. The Special Secretary, (Power) Department of Power, Government of Himachal Pradesh.
4. The Secretary, Department of Environment, Government of Himachal Pradesh, Forest Secretariat, Shimla.
5. The Chief Engineer, Project Appraisal Directorate, Central Electricity Authority, Sewa Bhawan, R. K. Puram, New Delhi - 110 066.
6. The DDG, Regional office, Ministry of Environment, Forests & Climate Change, Bays No.- 24-25, Sect-31A, Dakshin Marg, Chandigarh - 162 022.
7. The Member Secretary, Himachal Pradesh Pollution Control Board, Phase-III, Him Parivesh, New Shimla - 171 009.
8. Guard File/NIC Cell - uploading in MoEF&CC's website.



Yogendra Pal Singh
02.02.2021

(Yogendra Pal Singh)
Scientist 'E'

No. J-12011/08/2020-IA-I
 Government of India
 Ministry of Environment, Forest & Climate Change
 (IA.I Division)

Indira Paryavaran Bhawan
 3rd Floor, Vayu Wing
 Jor Bagh Road
 New Delhi-110 003

Dated: 05th August, 2020

To

The Executive Director (EDM)
 NHPC LIMITED
 NHPC OFFICE COMPLEX,
 SECTOR-33, FARIDABAD,
 HARYANA-121003

Sub: Dugar Hydroelectric Project (449 MW) in Chamba District of Himachal Pradesh, NHPC Ltd Terms of Reference-regarding

Sir,

This has reference to your online Proposal No. IA/HP/RIV/155974/2020 and letter no S. NH/Paryavaran&/215/8108 Dated 02.06.2020 submitted to the Ministry for ToR to the project cited in the subject.

2. The above referred proposal was considered by the Expert Appraisal Committee (EAC) for River Valley & Hydroelectric projects in its 33rd meeting held on 24.06.2020 under Schedule 1 (c) of the EIA Notification 2006 and as amended thereof. The comments and observations of EAC on the project may be seen in the Minutes of the meeting which are available on the website of this Ministry.

3. Project Proponent (PP) informed that in 2011, Government of Himachal Pradesh had allotted the Dugar HEP to M/S Dugar Hydropower Limited (a JV of Tata Power & SN Power). In 2012, MOEF&CC had accorded TOR to M/S DHPL for conducting EIA&EMP. In 2017, the validity of TOR was extended for the 5th year, which has expired on 31.12.2017. Draft EIA & EMP Report was prepared by M/s DHPL but Public hearing could not be conducted. In Sept 2017, Govt. of H.P cancelled the allotment of Project. NHPC entered into an MoU with Govt. of HP on 25/09/2019 to execute Dugar HEP. NHPC has taken over the DPR and other investigation data from M/S Dugar HPL (a JV of Tata Power & SN Power). As the earlier TOR has expired, a fresh TOR is requested in the name of NHPC Limited.

4. PP submitted that Dugar HEP is located on Chenab River near Killar village in Chamba district of Himachal Pradesh. The latitude and longitude of project site are N 33°07'05" and E 76°21' 20.7" respectively. The Dugar Hydro Electric Project (449 MW) is envisaged as a run-of-river scheme for utilizing the flows of Chenab River to harness the head created by constructing a 128 m high (from deepest foundation) dam and Length of Dam at Top is 210.65 m near Luj village with Full Reservoir Level (FRL) and Minimum Draw Down Level (MDDL) as 2114.00 m a.s.l. and 2102.35 m a.s.l., respectively.

5. The main components of the project are: A 128 m high concrete gravity dam (from the deepest foundation level); 2 nos. main intakes and 1 no. intake for auxiliary units located at the left bank; 2 nos. pressure tunnels/shafts and 1 no. pressure tunnel/shaft for auxiliary units; Underground Power house cavern housing 4 no. main units of 95 MW each and 2 nos. unit of 34.5 MW for auxiliary plant; 1 no. main TRT having tailrace surge chamber located downstream of power house cavern and 1 no. TRT for auxiliary units. The tail race tunnel, located on the left bank of the Chenab River, is discharging back into Chenab River at a distance of about 780 m downstream of dam axis with normal tail water level as 2015.00 m a.s.l. (under normal operating condition).

6. Total capacity of plant shall be 449 MW (380 + 69 MW). The catchment area of Project at Dam site: 7823 km². The total land requirement for Dugar HEP is estimated as 223.63 ha. Out of which 11.79 ha is private land and remaining 211.84 ha is forest land. The submergence area will cover 160.45 ha which is completely forest land. CIA study of Chenab basin was recommended by EAC during July 2016 and approved by MoEF&CC in March 2018. All the recommendation w.r.t. to Dugar HEP, including that on environment flow, will be adopted in Project design.

7. PP informed that total forest land required for the project is 211.842 ha, application for diversion of forest land was submitted on 31/12/2014. State Secretary, HP has recommended the case on 16/11/2016. Due to cancellation of the project, forest diversion proposal got stalled and shall be reinitiated shortly. As the project is located on Chenab River, this shall be governed by the relevant provisions of the Indus Water Treaty (IWT).

8. EAC in the 33rd meeting deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that project is located on Chenab River near Killar village in Chamba district of Himachal Pradesh and shall be governed by the relevant provisions of the Indus Water Treaty (IWT). EAC also observed that as per DSS analysis of kml file, the instant project is not located within 10 km distance from any wildlife sanctuary, national park.

9. EAC further observed that the earlier developer had projected cost of the project as Rs. 3390.74 Cr. at completion level in the DPR submitted in Central Electricity Authority (CEA) which was considered for concurrence in 341st meeting of the Authority held on 20.12.2016, while NHPC has projected project cost of as Rs 5415.60 Cr at present day price level. Reasons for such drastic increase in the cost may be justified in the proposal of final EC. EAC after

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detailed deliberation on the information submitted and as presented, **recommended** for grant of Standard ToR to the proposed project with some Additional ToRs.

10. Based on recommendations of the EAC, the Ministry of Environment Forest & Climate Change hereby accords a fresh Terms of Reference (TOR) as per the Standard ToR (Hydro projects) for activities at the proposed site as per the provisions of the Environmental Impact Assessment Notification, 2006 and as amended time to time along with the following additional ToR for preparation of EIA/EMP report:

Standard ToR

The EIA/EMP report should contain the information in accordance with provisions & stipulations as given in the **Standard ToR for hydro projects** (*Please visit the following link to download the Standard ToR:*

<http://environmentclearance.nic.in/writereaddata/standardtorreference.pdf>

Additional ToR

- i. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
- ii. The project involves diversion of about 211.842 ha of forestland. Forest clearance shall be obtained as per the prevailing norms of Forest (Conservation) Act, 1980.
- iii. Application to obtain prior approval of Central Government under the Forest (Conservation) Act, 1980 for diversion of forest land required should be submitted as soon as the actual extent of forest land required for the project is known, and in any case, within six months of issuance of this letter.
- iv. Funds allocation for Corporate Environment Responsibility (CER) shall be made as per O.M. No. 22-65/2017-IA.III dated 01.05.2018 for various activities therein.
- v. The details of funds allocation and activities for CER shall be incorporated in EIA/EMP report.
- vi. Consolidated EIA/EMP report is to be submitted as per the generic structure (Appendix III & IIIA) given in the EIA Notification, 2006.
- vii. The EIA report should clearly mention activity wise EMP and CER cost details and should earmarked clear break-up of the capital and recurring cost along with the timeline for incurring the capital cost.
- viii. Conservation plan for the Scheduled I species, if any, in the project study area shall be prepared and submitted to the Competent Authority for approval.

- ix. Pre-DPR Chapters viz., Hydrology and Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
- x. Dam break analysis, Disaster Management Plan and Fisheries Management Plan be prepared and submitted in the EIA/EMP report.
- xi. Environmental matrix during construction and operational phase needs to be submitted.
- xii. Both capital and recurring expenditure under EMP shall be submitted.
- xiii. Impact of developmental activity/project on the wildlife habitat, if any, within 10 km of the project boundary shall be studied.
- xiv. NOC from the earlier project proponent i.e. Dugar Hydroelectric Project Ltd. be obtained and submitted during appraisal of EIA/EMP
- xv. The consultant engaged for preparation of EIA/EMP report has to be registered with Quality Council of India (QCI/ NABET) under the scheme of Accreditation & Registration of MoEF& CC. This is a pre-requisite.
- xvi. Consultant shall include a "Certificate" in EIA/EMP report regarding portion of EIA/EMP prepared by them and data provided by other organization(s)/ laboratories including status of approval of such laboratories. Declaration by the Consultant that information submitted in the EIA/EMP is factually correct and shall be submitted along with EIA/EMP reports.
- xvii. An undertaking as part of the EIA report from Project proponent, owning the contents (information and data) of the EIA report with the declaration about the contents of the EIA report pertaining to a project have not been copied from other EIA reports.
- xviii. The draft EIA/EMP report prepared as per the Generic Structure (Appendix III of EIA Notification, 2006) incorporating information as per the Standard ToR, should be submitted to the State Pollution Control Board concerned for conducting Public Consultation, district wise, as per the provisions stipulated in EIA Notification, 2006. Public Hearing, which is a part of Public Consultation, shall be held district wise at the site or in its close proximity as prescribed in Appendix (IV) of EIA Notification, 2006. The draft EIA/EMP report is to be submitted to SPCB sufficient before the expiry of the ToR validity so that necessary amendments in EIA/EMP can be undertaken based on public hearing and the same is to be submitted to MoEF&CC before expiry of validity.
- xix. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/EMP report in the relevant chapter. Final EIA/EMP report should be submitted to the Ministry for Environmental Clearance only after incorporating these issues, before the expiry of validity of ToR.

xx. As per Ministry's Notification 17.02.2020, the ToR will remain valid for a period of 5 years from the date of issue of this letter for submission of EIA/EMP report along with public consultation. The ToR will stand lapsed after completion of 5 years in case final EIA/EMP is not submitted.

xxi. Baseline data and public consultation shall not be older than 3 years, at the time of submission of the proposal, for grant of Environmental Clearance.

xxii. In case of any change in the scope of the project such as capacity enhancement, change in submergence, etc., fresh scoping clearance has to be obtained.

xxiii. Details of the name and number of posts to be engaged by the project proponent for implementation and monitoring of environmental parameters be specified in the EIA report.

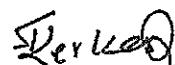
xxiv. The EIA/ EMP report must contain an Index showing details of compliance of all ToR conditions. The Index will comprise of page No. etc., vide which compliance of a specific ToR is available. It may be noted that without this index, EIA/ EMP report will not be accepted.

xxv. Appropriate Biodiversity Conservation and Management plan for the Native, Rare & Endangered floral and faunal species getting affected due to the project shall be prepared.

xxvi. The PP should complete all the tasks as per the provisions of EIA Notification, 2006 and as amended time to time) and submit the application for final clearance within the stipulated time.

This has approval of the Competent Authority.

Yours faithfully,



(Dr. S. Kerketta)

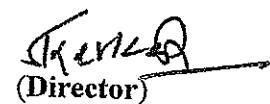
Director

Telefax: 011-24695314

Copy to:

1. The Secretary, Ministry of Power, Sharm Shakti Bhawan, Rafi Marg, New Delhi-110001
2. The Secretary, Ministry of Water Resources, RD & GR, Sharm Shakti Bhawan, Rafi Marg, New Delhi-110003.
3. The Special Secretary (Power), Department of Power, Govt. of Himachal Pradesh

4. The Secretary, Department of Environment, Govt. Of Himachal Pradesh, Forest Secretariat, Shimla.
5. The Chief Engineer, Project Appraisal Directorate, Central Electricity Authority, Sewa Bhawan R.K. Puram, New Delhi-110066.
6. The DDG, Regional Office, Ministry of Environment, Forest & Climate Change, Bays No 24-25, Sector-31 A, Dakshin Marg, Chandigarh-162022.
7. The Member Secretary, Himachal Pradesh Pollution Control Board, Phase-III, Him Parivesh, New Shimla-171009.
8. NIC Cell - uploading in MoEFCC's website.
9. PPS to JS (GM)
10. Guard File


(Director)

COST-BENEFIT ANALYSIS of DUGAR HEP

Table-A: Cases under which a cost-benefit analysis for forest diversion are required

| SN | Nature of Proposals | Applicable/Not Applicable | Remarks |
|----|--|---------------------------|--|
| 1 | All categories of the proposals involving forest land upto 20 ha in plains and upto 5 ha in hills | NA | These proposals are to be considered on case to case basis and value judgment |
| 2 | Proposal of defense installation purposes and oil prospecting (prospecting only) | NA | In view of National priority accorded to these sectors, the proposals shall be critically assessed to help ascertain that the utmost minimum forest land and above is diverted to for non-forest use |
| 3 | Habitation, establishment of Industrial units, tourist lodges/complex and other building construction. | NA | These activities being detrimental to protection and conservation of Forests, as a matter of policy, such proposals would be rarely entertained |
| 4 | All other proposals involving forest land more than 20 ha in plains and more than 5 ha in hills including roads, transmission lines, minor, medium and major irrigation projects, hydel projects mining activities, railway lines, location specific installation like micro-wave stations, auto repeater centres, TV tower etc. | Applicable | These are cases where a cost benefit analysis is necessary to determine when diverting the forest land to non-forest use in overall public interests. |


 महाप्रबंधक
 General Manager
 दुगर जल विद्युत परियोजना
 Dugar Hydro Electric Project
 नग्वाई जिला मण्डी (ह.प.)-175121
 Nagwani, Distt. Mandi (H.P.)-175121

Table-B: Estimation of cost of forest diversion

| SN | Parameters | Remarks |
|----|---|--|
| 1 | Ecosystem services losses due to proposed forest diversion | Economic value of loss of eco-system services due to diversion of forests land determined by State Forest Department for previous user agency (DHPL) as a Net Present Value (NPV) is Rs. 20.88 Crore |
| 2 | Loss of Animal husbandry productivity including loss of fodder | Rs. 2.08 Crore (i.e. 10% of NPV Cost) |
| 3 | Cost of Human resettlement | No displacement |
| 4 | Loss of public facilities and administrative infrastructure (Roads, building, School, dispensaries, electric lines, railways etc) on Forest land, or which would require forest land if these facilities were diverted due to the project | None of the public facilities and administrative infrastructure will be affected due to the project |
| 5 | Possession value of forest land diverted | Rs. 6.26 Crore (i.e. 30% of NPV Cost) |
| 6 | Cost of suffering to oustees | None of the oustees will suffer from project establishment. |
| 7 | Habitat Fragmentation Cost | The relationship between fragmentation and forest goods and services is complex, for the sake of simplicity the cost due to fragmentation has been taken as Rs. 10.44 Crore (i.e. 50 % of NPV applicable as a thumb rule) |
| 8 | Compensatory Afforestation and Soil & moisture conservation cost | The actual cost of compensatory afforestation and soil & moisture conservation and its maintenance is determined by State Forest Department for previous user agency (DHPL) is Rs. 4.63 Crore. |
| | Grand Total | 44.29 Crore |

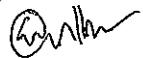

 महाप्रबंधक
 General Manager
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 नगवाई, जिला मण्डी (हिम.)-175121
 Nagwain, Distt. Mandi (H.P.)-175121

Table-C: Existing guidelines for estimating benefits of forest-diversion in CBA

| | | Nature of Proposal |
|-----------|---|--|
| SN | Parameter | Hydroelectric Project |
| 1 | Increase in productivity attributable to the specific project | <p>1. Net design energy (Annual) = 1758.40 GWH Cost of saleable net design energy @ 4.62 / kWh (Levelised tariff) Rs. = 812.38 Crore Assuming O&M life as 62 years, Hence $812.38 \times 62 = \text{Rs. } 50367.56$ crore i.e.Rs. 50367.56 cr. - 6547.78 cr. (13% benefit to State Govt.) = Rs. 43819.78 crore</p> <p>2. Sixteen Revenue villages would gain better road connectivity and the travel time would be reduced by an average of one hour Total population of 4500 will be benefitted and with saving of 1 hr/day. Therefore, $4500 \times$ Reduced time in travel by 1 hr * 30 days*12 month*70 years @ Rs 35 per man hr = Rs 396.90 Crore.</p> <p>3. Population of 4500 person will be benefitted and gain of at least 60 man days/ year due to the better development of the hospital in the project area, Hence $365 \text{ days} \times$ saving of 60 man days*70 years@ Rs 300/day= Rs 45.99 Crore. Rs. 43819.78 + 396.90 + 45.99 = 44262.67 Crore</p> |
| 2 | Benefits to economy due to the specific project | <p>Benefits to the State Economy The estimated cost of the project is Rs 4426.19 crores and all necessary finances for the implementation of the project through loans, debentures, its own income from previous projects or such other sources. As per the Memorandum of Understanding (MoU), Government of Himachal Pradesh will get the Royalty Free Energy in the shape of free power @4% from 1st to 10th year, @8% from 11th to 25th year, 12% from 26th to 40th year & 25% beyond 40 years and 1% additional free Power for LADF of the deliverable energy, period starting from the date of Scheduled Commercial Operation Date / Synchronization of the first generation unit, whichever is earlier.</p> <p>NHPC Limited shall be liable to deposit an equivalent amount of 100 units of electricity, per month for a period of 10 years, as per applicable subsidized tariff determined by Himachal Pradesh Electricity Regulatory Commission (HPERC) from time to time, with respective Local Area Development Committees (LADCs) of the districts and the balance amount equivalent to the quantum of subsidy with the State Government.</p> <p>NHPC Limited shall contribute 1.5 % of the cost of the project towards pre-commissioning Local Area Development Fund (LADF). In addition to this, NHPC shall also run Community Development Schemes and Corporate Social Responsibility programs for the villages within / around the Project site, entwined to cater to local area development including capacity / skill development of affected population, as per the objectives and policies.</p> <p>Benefits to the Local Economy</p> <p>NHPC Limited shall contribute 1.5 % of the cost of the project (Rs 4426.19 Crores) = $4426.19 \times 0.015 = 66.39$ Crore towards pre-commissioning Local Area Development Fund (LADF).</p> |

| | |
|---|---|
| | <p>In addition to this, NHPC shall also run Community Development Schemes and Corporate Social Responsibility programs for the villages within / around the Project site, entwined to cater to local area development including capacity / skill development of affected population, as per the objectives and policies.</p> <p>720000 Man days (1000 Man power for 24 months) would be generated due to the direct employment of labors including locals during pre-construction stage @ 400/Man day= $720000*400 = 28.80$ Crore.</p> <p>5,550,000 Man days (2500 Man power for 74 months) would be generated due to the direct employment of labors including locals in the construction of the project. $5,550,000*500 =$ Rs 277.50 Crore</p> <p>80 labors/month will get the employment during O&M stage to fulfill the requirement of various casual jobs for 62 years assuming average @600/day= Rs 107.13 Crore</p> <p>Local contractors will be engaged for suitable jobs and 20% of the Construction cost will be carried out by them. Assuming 15% as their profit margin for the contract works, $Rs 4426.19*20%*15% =$ Rs 132.78 Crore</p> <p>Local Transport vehicles will be utilized during construction period, Assuming 1% as the total value and 20% as the profit margin, the total benefits would be 8.85 Crore</p> <p>Indirect Employment</p> <p>Indirect Employment to locals in terms of the Support business to satisfy the needs of manpower deployed in the project during Pre-Construction, Construction and Operation and Maintenance periods:</p> <p>Pre-Construction: Rs 4000/- per month from 1000 labors for 2 years- Rs 9.60 Crores</p> <p>Construction: Rs 4000/- per month from 2500 labors for 6 years- Rs 72 Crores</p> <p>O&M: Rs 4000/- per month from 80 labors for 62 years- Rs 23.80 Crores</p> |
| 3 | No of Population benefited due to specific project |
| 4 | <p>6120000 Mandays during Pre-construction (1000 Man power for 24 months) and at construction stage (2500 Man Power for 72 months)</p> <p>2232000 Mandays during operation stage. (80 Man power as casual labors for 744 months)</p> <p>Indirect Employment</p> <p>Indirect employment to locals in terms of the support businesses to satisfy the needs of manpower deployed in the project during Pre-construction, Construction and Operation and Maintenance (O&M) periods.</p> |
| 5 | Economic benefits due to Compensatory afforestation |

The forest area which required to be diverted for the project is 211.842 hectare. The compensatory afforestation will be done on the area of approx. 423.684 hectare, where about 466000 plants will be planted at a cost of Rs. 4.63 Crore. Due to this

| | | |
|--|--|---|
| | | afforestation, not only green cover will increase but the density of forest will also increase. The money spent on compensatory afforestation will lead to indirect benefits to the local population as they will be employed for the plantation and thereafter maintenance of the afforestation area. Due to this afforestation decrease the pollution levels and increase the carbon credits. |
|--|--|---|

| Benefits from Project | | |
|--|-----------|-----------------|
| LADF | Rs Crores | 66.39 |
| Increase in Productivity | Rs Crores | 44262.67 |
| Pre-Construction Labour Cost | Rs Crores | 28.80 |
| Construction Labour Cost | Rs Crores | 277.50 |
| Operation and Maintenance casual jobs | Rs Crores | 107.13 |
| Local Contractor Profit | Rs Crores | 132.78 |
| Local Vehicles Profit | Rs Crores | 8.85 |
| Indirect Employment in Pre-Construction | Rs Crores | 9.60 |
| Indirect Employment in Construction | Rs Crores | 72.00 |
| Indirect Employment in O&M | Rs Crores | 23.80 |
| Benefit to the State of Himachal Pradesh ($1758.40 \times 10^6 \times 4.62 = 812.38$ Cr./yrs) (812.38 Cr x 62yrs = 50367.56 Cr) (50367.56 Cr x 13% = Rs. 6547.78 Cr) | Rs Crores | 6547.78 |
| Total Benefits | Rs Crores | 51537.30 |

Benefit/Cost Ratio:

| | |
|---------------------------|-----------------------|
| Total Benefit | 51537.30 Crore |
| Total Cost | 4426.19 Crore |
| Benefit cost ratio | 11.64 |

Benefits to the Environment

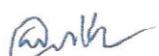
The project would replace the carbon emissions to the extent of power generation, which is equivalent to the estimated energy generation of 1758.40 MU in 90% dependable year.


 महाप्रबंधक
 General Manager
 दुगर जल विद्युत परियोजना
 Dugar Hydro Electric Project
 नगवाई, गिला सजड़ी (हि.प्र.)-175121
 Nagwain, Distt. Mandi (H.P.)-175121

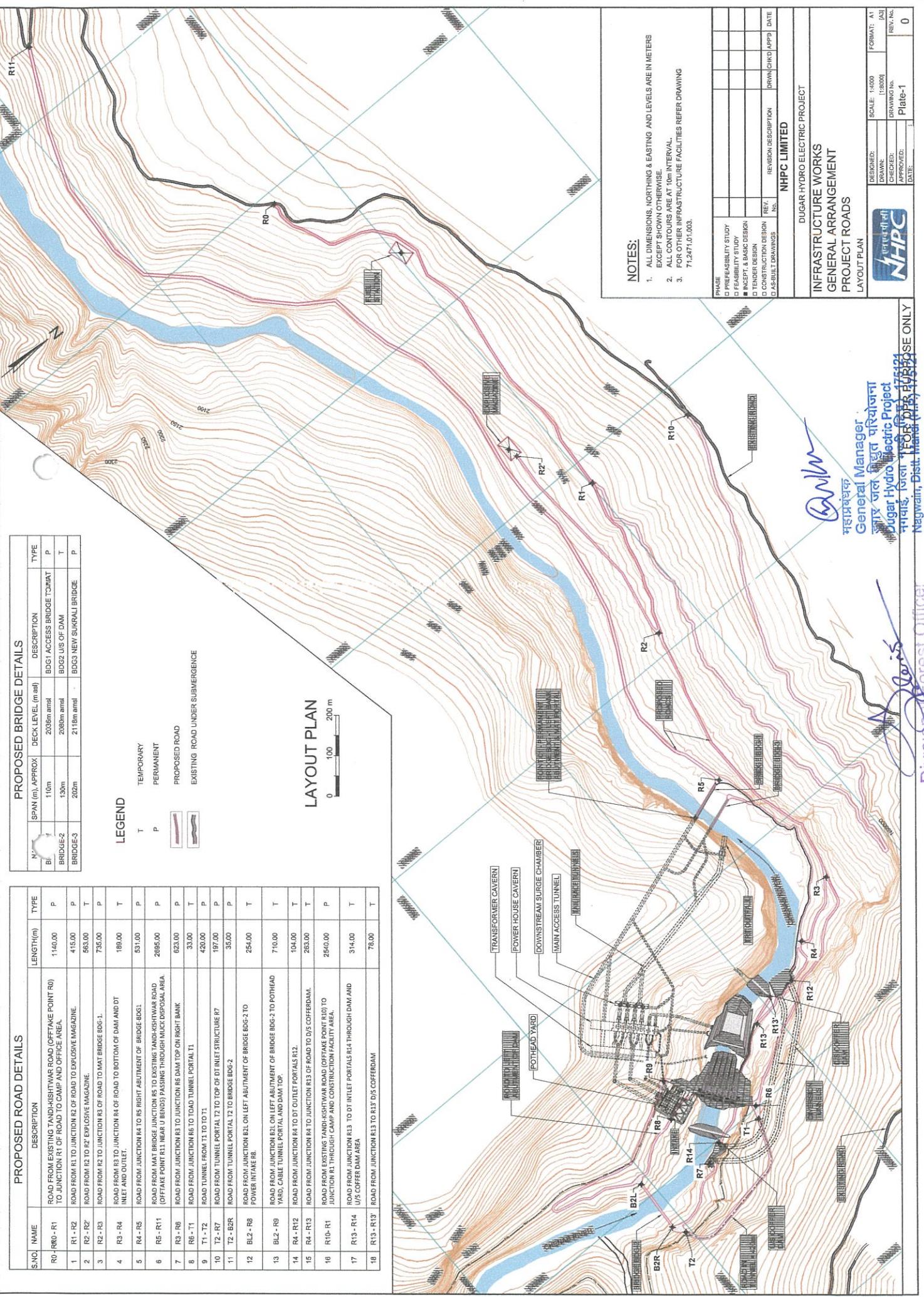
| Component and Dimension wise land breakup | | | | | | | |
|---|---|------------------|----------------------|---------------------------|------------------|---------------|--------------|
| Sl. No. | Component | Forest Land (ha) | Non-Forest Land (ha) | Maximum Length (in Meter) | Width (in Meter) | Area (in Sqm) | Area (in ha) |
| 1 | Submergence including River Area | 160.45 | 0 | 16050 | 100 | 1605000 | 160.5 |
| 2 | Dam | 5.83 | 0 | 390 | 150 | 58500 | 5.85 |
| 3 | Approach Roads | 8.168 | 0 | 5445 | 15 | 81675 | 8.1675 |
| 4 | Quarry Area | 8.625 | 0 | 620 | 140 | 86800 | 8.68 |
| 5 | Borrow Area | 3.88 | 0 | 259 | 150 | 38850 | 3.885 |
| 6 | Muck Dumping Area | 8.5797 | 0 | 446 | 192 | 85632 | 8.5632 |
| 7 | Job Facility Area | 7.08 | 0 | 695 | 102 | 70890 | 7.089 |
| 8 | Construction Facility Area | 0 | 6.62 | 530 | 125 | 66250 | 6.62 |
| 9 | Owner / Developer Colony including Permanent & Temporary establishments excluding Administrative Building / Offices | 0 | 1.98 | 130 | 150 | 19500 | 1.95 |
| 10 | Owner's Office | 0 | 0.18 | 50 | 35 | 1750 | 0.17 |
| 11 | Power House | 3.64 | 0 | 250 | 146 | 36500 | 3.65 |
| 12 | HRT | 0.4 | 0 | 220 | 20 | 4400 | 0.44 |
| 13 | TRT | 1.81 | 0 | 1000 | 18 | 18000 | 1.8 |
| 14 | TRT Outfall | 0.74 | 0 | 180 | 41 | 7380 | 0.738 |
| 15 | Diversion Tunnel | 1.84 | 0 | 660 | 28 | 18480 | 1.848 |
| 16 | MAT | 0.8 | 0 | 610 | 14 | 8540 | 0.854 |
| | Total | 211.8427 | 8.78 | | | | |
| | Grand Total | 220.6227 | | | | | |



 Divisional Forest Officer
 Pangri Forest Division
 KILLAR

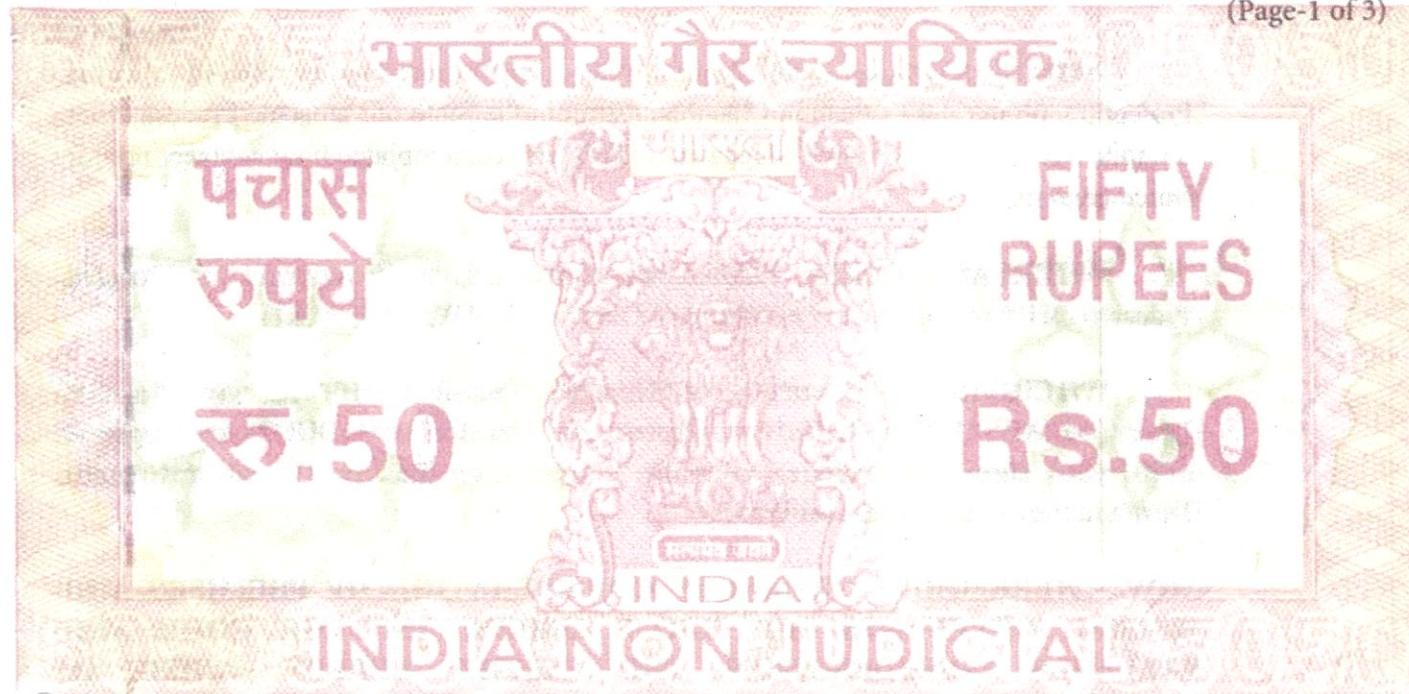


 महाप्रबंधक
 General Manager
 डुगर जल विद्युत परियोजना
 Dugar Hydro Electric Project
 नगवाई, जिला मण्डी (हिम.)-175121
 Nagwain, Distt. Mandi (H.P)-175121



महाराष्ट्र सरकार
General Manager
महाराष्ट्र जल वित्त परियोजना
Dugar Hydro Electric Project
नवायड, जला विभाग, नवायड, महाराष्ट्र, 412552
Nagpur, Distt. Maharashtra, India, 412552

Division of Forest Office
Pangi Forest Division
KILLAR



हिमाचल प्रदेश HIMACHAL PRADESH

C 423182

MEMORANDUM OF UNDERSTANDING SIGNED BETWEEN THE GOVERNMENT OF HIMACHAL PRADESH AND NHPC LIMITED FOR THE EXECUTION OF DUGAR (449 MEGAWATT) HYDRO ELECTRIC PROJECT IN CHENAB RIVER BASIN IN HIMACHAL PRADESH

This Memorandum of Understanding (MOU) is executed and entered into on this 25th day of September in the year Two Thousand and Nineteen between the Governor of Himachal Pradesh through the Principal Secretary, Department of Multipurpose Projects and Power to the Government of Himachal Pradesh having its office at Civil Secretariat, Shimla-171002 (here-in-after referred to as the "Government" which expression, unless repugnant to the context or meaning thereof, shall include its successor(s) administrator(s) or permitted assigns), of the FIRST PART.

AND

NHPC Limited, a company incorporated under the Companies Act, 1956, and also a 'Generating Company' within the meaning of Section 2 (28) of the Electricity Act, 2003, having its registered office at N.H.P.C Office Complex, Sector-33, Faridabad - 121003 (Haryana) (here-in-after referred to as the "NHPC Limited" through the Chairman and Managing Director who has been duly authorized to execute the MoU which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its successor(s), administrator(s), and permitted assigns) of the SECOND PART.

1

Om N
महाप्रबंधक
General Manager
दुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हिमाचल प्रदेश)-175121
Nagwain, Distt. Mandi (H.P.)-175121

Om N
नाम: ओम नाथ
पद: चेयरमैन & मैनेजिंग डिप्टर
प्राप्ति नं.: 00000000000000000000
प्राप्ति तिथि: 25/09/2019
संस्था: न्यूजीलैंड एंड ब्रिटिश एंड एसियान एंड एसियान एंड एसियान

(D) NHPC Limited shall contribute 1.5 % of the cost of the project towards pre-commissioning Local Area Development Fund (LADF).

3. NHPC Limited shall prepare and implement Rehabilitation & Resettlement (R&R) Plan for the Project as per the GoHP guidelines and approval, which shall not be lesser beneficial to Right to Fair Compensation and Transparency in Land Acquisition and Rehabilitation & Resettlement (RFCLARR) Act, 2013. In addition to R&R, the Company shall also run Community Development Schemes and Corporate Social Responsibility programs for the villages within/around the Project site, entwined to cater to local area development including capacity/skill development of affected population, as per the objectives and policies of the company which shall be other than the LADF contribution.

4. NHPC Limited shall provide employment to Himachalies in accordance with the provisions of Hydro Power Policy-2006.

5. The detailed terms and conditions of the Implementation Agreement (IA) shall be formulated with the mutual agreement of GoHP and NHPC Limited.

6. As per the provisions of Hydro Power Policy, 2006 of the State, the NHPC Limited / Developer shall be liable to reimburse to the Himachal Pradesh State Electricity Board Limited (HPSEBL) / Himachal Pradesh Power Corporation Limited (HPPCL), the expenditure incurred on account of Survey & Investigations carried on the Project.

7. The detailed timelines/ milestones shall be finalized at the time of signing of Implementation Agreement.

IN WITNESS WHEREOF, THE PARTIES HERETO HAVE CAUSED THE CONTENT OF MOU TO BE SIGNED, SEALED AND DELIVERED BY THEIR DULY AUTHORIZED REPRESENTATIVES ON THE DAY, MONTH AND YEAR FIRST ABOVE WRITTEN.

**For and on behalf of
Government of Himachal Pradesh**

*Pr. Secretary (Power) to the
DGP
Civil Secretary (NPP & Power),
Government of Himachal Pradesh,
Civil Secretariat Shimla-171002 (H.P)*

Witnessed by:

1. *Mohit*

*Manasi Sahay Thakur
Director (Energy)*

2.

P.K.S. Rachela

Chief Engineer, DAE

**For and on behalf of
M/s NHPC Limited**

Rajesh Kumar
Chairman & Managing Director
NHPC Limited / Sector - 33, Faridabad
NHPC Office Complex, Sector-33,
Faridabad - 121003 (Haryana)
Witnessed by:

1.

(M.K.Joel)
Executive Director

2.

Marish Kumar
M/s Internal Manager
NHPC Limited

Om Shukla
General Manager
Dugar Jhal Bidyut Parivrojana
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हिम.)-175121
Nagwain, Distt. Mandi (H.P.)-175121

Himachal Pradesh
Public Works Department

No-PW-KD-CB-WA-NOC/2015-16

50-53

Dated 02/04/15

To

Dugar Hydro Power Limited,
C/o Statkraft Limited,
Block-A, Plot- A/II, 4 floor MGF Metropolitan Mall Saket Distt.
Center New Delhi-110017.

Subject: -

Request for issuance of no objection certificate for 449 MW
Dugar Hydro electric project in Chamba District of HP being
implemented by Dugar Hydro Power Limited, No objection
certificate.

Reference: -

Your office letter No. Dugar/Progress report/20140901-02 date
01-09-2014

With reference to approval conveyed by the Resident
Commissioner Pangi at Killar vide noting para 4 dated 15/11/2014, no objection certificate is
hereby issued in your favour in respect of Himachal Pradesh Irrigation & Public Health
Department (I&PH) with the following terms and conditions:-

1. The company has to restore all the existing water supply scheme, FIS & irrigation
schemes or bear the expenditure for the same, which will get submerged in the reservoir
after construction of the project.


Executive Engineer,
Killar Division HP PWD,
KKillar (Pangi) HP PWD
Killar (Pangi)

Copy forwarded to The Resident Commissioner Pangi at Killar for
information and necessary action with reference to noting Para 4 approved dated
15/11/2014.

Copy forwarded to Assistant Engineer I&PH Sub-Division Killar for
Information and necessary action.

Copy to Drawing Branch of this office for information.


Executive Engineer,
Killar Division HP PWD,
Killar (Pangi)


महाप्रबंधक
General Manager
डुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगायाई, जिला मण्डी (हिम.)-175121
Nagain, Distt. Mandi (H.P.)-175121

188

OFFICE OF THE ASSISTANT DIRECTOR, ANIMAL HEALTH/BREEDING-CUM-CONTROLLING OFFICER,
CONTROLLING(FISHERIES IN PANGI VALLEY) PANGI AT KILLAR.

To

The Site In-Charge,
Dugar Hydro Power Limited,
Killar Tehsil, Pangi Distt, Chamba H.P.

Dated Killar the 27th March, 2015.
Sub:- Issue of No Objection Certificate for 449 MW Dugar Hydro Electric Project on River
Chenab at Vicinity Village Luj T ehsil, Pangi Distt, Chamba H.P.

Sir,
With Reference to your letter No.DHPL/SO/201512/-12 Dated 12 January, 2015 on
the subject cited above.

In this context the No Objection Certificate in favour of M/S Dugar Hydro Power
Limited, Killar Tehsil, Pangi Distt, Chamba H.P. for the construction of 449 MW Dugar Hydro Electric Project on
River Chenab at Vicinity Village Luj T ehsil, Pangi Distt, Chamba H.P. is being issued on the following terms and
conditions:

1

The Fishing licencing Authority rights will be reserved with the Department of
Fisheries in the reservoir of the 449 MW Dugar Hydro Electric Project on River
Chenab at Vicinity Village Luj T ehsil, Pangi Distt, Chamba H.P.

2

M/S Dugar Hydro Power Limited, Killar Tehsil, Pangi Distt, Chamba H.P. will help in
development of Fisheries in the reservoir of the 449 MW Dugar Hydro Electric Project
on River Chenab at Vicinity Village Luj T ehsil, Pangi Distt, Chamba H.P.


Assistant Director, Animal Health/Breeding-cum-Controlling Officer,
(Fisheries in Pangi Valley) Pangi at Killar, Phone No. 01897-242226.

No. FSH-PNG/G(1)4/2014-

Dated Killar the 27th March, 2015.

Copy for information to:

1.

The Worthy Director-cum-Chief Warden of Fisheries, H.P. Billaspur H.P. for information
please.

2.

The Sub Division Officer (Civil) Sub Division, Pangi at Killar for information with
reference to their letter No. SDK/PNG/2015-117-119 dated 12/01/2015 please.


Assistant Director, Animal Health/Breeding-cum-Controlling Officer,
(Fisheries in Pangi Valley) Pangi at Killar, Phone No. 01897-242226.


महाप्रबंधक
General Manager
दुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हिम.)-175121
Nagwain, Distt. Mandi (H.P.)-175121



NH/PID/Dugar/2021/ 991

संदर्भ सं./Ref. No. _____

एन एच पी सी लिमिटेड
(भारत सरकार का उद्यम)

NHPC Limited
(A Government of India Enterprise)

फोन/Phone : _____

दिनांक/Date : 0129-2279134

17.02.2021

Email: copid.dprgroup@gmail.com

To,
The Principal Chief Conservator of Forests (HoFF),
Govt. of Himachal Pradesh, Shimla-1,
Himachal Pradesh -171001.

Sub:- Authorization Letter.

Sir,

NHPC Limited, a Mini Ratna Category-I, Enterprise, under Ministry of Power, Govt. of India is a premier hydropower generation company that was incorporated in the year 1975 and with an objective to plan, promote and organise an integrated and efficient development of hydroelectric power in all aspects.

Dugar HE Project (500 MW), a run-of-river scheme, is located on Chenab River at Luj village, at about 12 kms from Killar, Tehsil headquarter of Pangi Valley of Distt. Chamba, in Himachal Pradesh. The project comprises of 128m high concrete gravity Dam & two nos. underground Pressure Shafts. An underground Power House is proposed on the left bank of the river with four units of 103 MW capacity each and two auxiliary units of 44 MW capacity each. For the execution of Dugar HE Project (500 MW), in Chenab basin, a MoU has been executed & entered between Govt. of HP & NHPC Ltd. on 25.09.2019.

For the purpose of construction of Dugar HE Project a proposal for diversion of forest land measuring 211.842 ha in Pangi Forest Division is being submitted to the Department of Forests, Government of Himachal Pradesh. The application for diversion of forest land is required to be submitted online. In order to submit online application on the behalf of Dugar HE Project, Sh. Shashi Kant, General Manager, Emp. No. 110640A is hereby authorized for placing online indent for diversion of 211.842 ha of the Forest land.

Thanking you,

Yours Sincerely,

(Anil Kumar Jain)
GM (I/C) PID

| | | |
|--|---|---|
|  <p>एन एच पी सी NHPC</p> <p>CIN:L40101HR19 75GOI032564</p> | <p>एनएचपीसी लिमिटेड (भारत सरकार का सूची 'ए' उद्यम) NHPC Limited (A Schedule 'A' Enterprise of Govt. of India)</p> <p>सरकार एक क्रम सचित्रा की ओर</p> | <p>दुगर जल विद्युत परियोजना पार्बती परिसर, नगवाई, जिला मण्डी (हिंप्र०) 175121</p> <p>Dugar HE Project Parbati Complex, Nagwain, Distt.- Mandi (H.P.) 175121</p> <p>फोन/ Tel. 01905 280260 E-mail: dugarhep@gmail.com</p> |
|--|---|---|

To whomsoever it may Concern

Approval of Catchment Area Treatment Plan of Dugar HE Project

In the State of Himachal Pradesh, 1.5% of the Project cost of the project is given by the project proponent towards Catchment Area Treatment (CAT) Plan. As the Environment Clearance of the project is underway and CAT Plan of the Project is being prepared by Independent Authority / Consultant as a part of the EIA / EMP Study. Since the CAT Plan of the Project has not been approved by the competent authority, the approved CAT Plan of the Project has not been attached herewith the online application.



(शशी कांत)
महा प्रबंधक,
दुगर जल विद्युत परियोजना

महाप्रबंधक
General Manager
दुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हिंप्र०)-175121
Nagwain, Distt. Mandi (H.P)-175121

SHORT NARRATIVE OF THE PROPOSAL AND PROJECT/SCHEME FOR WHICH FOREST LAND IS REQUIRED

Government of Himachal Pradesh (GoHP) has signed Memorandum of Understanding (MoU) with NHPC Limited on 25th September 2019 for the implementation of Dugar Hydroelectric Project on Build Own Operate & Transfer Basis (BOOT) for a period of 70 years including DPR and pre construction periods. The project is proposed on Chenab River and is located in the Pangi Valley (killar) which is remote area of Chamba district of Himachal Pradesh. This project has been envisaged as Run of River scheme with underground Power House.

The Dugar Hydro Electric Project (500 MW) is envisaged as a run-of-river scheme for utilizing the flows of Chenab River to harness the head created by constructing a 128 m high (from deepest foundation) dam near Luj village with FRL of EL 2114.00 masl and the proposed underground power house located on the left bank of Chenab River just downstream of dam. It is a medium head scheme with rated net head of 91.21 m having Full Reservoir Level (FRL) and Minimum Draw Down Level (MDDL) as 2114.00 masl and 2102.35 masl respectively. It is essentially a run-of river scheme with diurnal storage for generation of electricity. The project comprises of a 128 m high concrete gravity dam (from deepest foundation level), 2 Nos underground circular pressure shafts of length 270 m and 307 m. Each pressure shaft is bifurcated upstream of the unit valves. An underground power house is envisaged followed by a tailrace surge chamber and two tail race tunnels of finished diameter as 7.8 m. The tail race tunnels, located on the left bank of the Chenab River, are discharging back into Chenab River at a distance of about 725 m downstream of dam axis with normal tail water level as 2015.00 masl (under normal operating condition) and minimum tail water level as 2012.26 masl.

An underground Power House cavern, housing 4 units of 103 MW each, is envisaged along with a d/s Surge Chamber & u/s Transformer Cavern & a Tail Race Tunnel. To harness the environmental flow during lean season and non-lean non-monsoon season three units each of 44 MW are housed in the power house cavern. Therefore the total capacity of plant shall be 500 MW (412 + 88 MW).

The main components of the project are:

- A 128 m high concrete gravity dam (from the deepest foundation level) located on River Chenab at Latitude N 33° 07' 05" and longitude E 76° 21' 20.7".
- Two numbers main intakes and one intake for auxiliary power house located at the left bank.
- Two numbers main pressure shafts and one pressure shaft for auxiliary power house.
- Underground cavern housing four number main units of 103 MW each and two units of 44 MW each for auxiliary power house.
- Transformer Cavern located upstream of power house cavern.
- Four number main TRTs having Surge Chamber at the upstream end and one TRT for auxiliary power house discharging downstream of dam.

CHAPTER - I

INTRODUCTION

1.0 GENERAL

The state of Himachal Pradesh has vast Hydro Power potential. The main rivers that flow through Himachal Pradesh are Satluj, Beas, Ravi and Chenab. The Chenab River also known as Chandra Bhaga River in its upper reaches is formed by the confluence of two rivers viz. Chandra and Bhaga at Tandi near Keylong in Lahaul & Spiti district of Himachal Pradesh. Chenab River enters Pangi valley of Chamba district in Himachal Pradesh near Bhujind and leaves the district at Sansari Nala to enter Paddar valley of Kashmir. Dugar Hydro Electric Project is in Pangi valley on Chenab River and is a run-of-river scheme.

The Dugar HE Project was allotted to M/s Dugar Hydro Power Limited (DHPL), a joint venture of M/s Tata Power Co. Ltd. & M/s SN Power Holding, Singapore Pte. Ltd. (Statkraft) by Government of Himachal Pradesh on Build, Own, Operate & Transfer (BOOT) basis. Accordingly, M/s DHPL had prepared the Detailed Project Report of Dugar HE Project and submitted to CEA for detailed examination vide their Letter No. Dugar/CEA/Consultation-Meeting/20160516-01 dated May 16, 2016. Subsequently, M/s DHPL surrendered the project back to the Government of Himachal Pradesh.

NHPC Limited has signed a Memorandum of Understanding(MOU) with the Government of Himachal Pradesh for execution of Dugar HE Project (449 MW) on Build, Own, Operate & Transfer (BOOT) basis for the period of 70 years on the River Chenab, in Chamba District of Himachal Pradesh on September 25, 2019.

The Project is now proposed for an enhancement of installed capacity from 449 MW to 500 MW after optimization of Power Potential study, which comprises 4 main units of 103 MW and 2 auxiliary units of 44 MW each. These

Detailed Project Report
Dugar Hydroelectric Project (500 MW)



| | | |
|-------------------------------------|-----------------------|-------|
| Flood discharge for river diversion | m^3/s | 2,700 |
| Probable Maximum Flood (PMF) | m^3/s | 9,425 |

Reservoir

| | | |
|--|--------------------|---------|
| Full Reservoir Level (FRL) | m | 2114.00 |
| Maximum Water Level (corresponding to PMF) | m | 2114.00 |
| Minimum Draw Down Level (MDDL) | m | 2102.35 |
| Gross storage at FRL | 10^6 m^3 | 61.58 |
| Gross storage at MDDL | 10^6 m^3 | 45.01 |
| Live storage | 10^6 m^3 | 16.57 |

Dam & Spillway

| | | |
|----------|---|------------------|
| Dam Type | - | Concrete Gravity |
|----------|---|------------------|

| | | |
|--------------------|-----------------------|------|
| Design flood (PMF) | m^3/s | 9425 |
|--------------------|-----------------------|------|

| | | |
|----------------|---|--------|
| Top of the dam | m | 2116.0 |
|----------------|---|--------|

| | | |
|----------------------------|---|--------|
| Full reservoir level (FRL) | m | 2114.0 |
|----------------------------|---|--------|

| | | |
|-----------------------------|---|--------|
| Average river bed elevation | m | 2017.0 |
|-----------------------------|---|--------|

| | | |
|------------------------------|---|--------|
| Deepest foundation elevation | m | 1988.0 |
|------------------------------|---|--------|

| | | |
|----------------------|---|--------|
| Length of dam at top | m | 210.65 |
|----------------------|---|--------|

| | | |
|----------------|---|-------|
| Maximum height | m | 128.0 |
|----------------|---|-------|

| | | |
|------------------------|---|----|
| Total number of blocks | - | 13 |
|------------------------|---|----|

| | | |
|---------------------------|---|----|
| Number of overflow blocks | - | 06 |
|---------------------------|---|----|

| | | |
|-------------------------------|---|----|
| Number of non overflow blocks | - | 07 |
|-------------------------------|---|----|

Detailed Project Report
Dugar Hydroelectric Project (500 MW)



| | | |
|---|---|--------------------------|
| No. of diversion tunnels | - | 02 |
| Diameter of each diversion tunnel | m | 11.5 m, Horse-shoe shape |
| Length of diversion tunnel | m | 463.0 (DT1), 577.0 (DT2) |
| Invert level of diversion tunnel inlet | m | 2022.0 |
| Invert level of diversion tunnel outlet | m | 2016.0 |
| Top of upstream coffer dam | m | 2043.70 |
| Height of upstream coffer dam | m | ~23.7 |
| Top of downstream coffer dam | m | 2029.50 |
| Height of downstream coffer dam | m | ~ 13.5 |
| Diversion tunnel inlet gate type and number for each diversion tunnel | - | Fixed wheel type, 02 |
| Size of each diversion tunnel gate | m | 4.7 (W) x 11.5 (H) |

Power Intake

Main Power Plant

| | | |
|----------------------------------|-------------------|----------------------------------|
| Location | - | Left bank |
| No. and Size | - | 02 Nos., 23.05m (W) x 34.35m (H) |
| Design discharge for each intake | m ³ /s | 252 |

Detailed Project Report
Dugar Hydroelectric Project (500 MW)



Auxiliary Plant

| | | |
|--|-----------------------|--------|
| No. of pressure tunnel/shaft | - | 01 |
| Design discharge for pressure tunnel/shaft | m^3/s | 113.66 |
| Internal diameter of steel lined pressure tunnel/shaft | m | 5.1 |
| Length of steel lined pressure tunnel/shaft | m | 251.7 |
| Internal diameter of steel lined pressure tunnel after bifurcation | m | 3.7 |
| Length of each steel lined pressure tunnel after bifurcation | m | 29.9 |

Power House

Power house for main units

| | | |
|--|-----------------------|------------------------|
| Type | Underground | |
| Size (L x W x H) including auxiliary units | m | 164.5 x 22 x 46.7 |
| Gross head (Average) | m | 94.8 |
| Nos. & type of Turbine | -- | 4 Nos., Francis |
| Turbine c/l elevation | m | 2002.50 |
| Design discharge per unit | m^3/s | 126 |
| Rated head | m | 90.10 |
| Installed capacity per Unit | MW | 103 |
| Nos.& type of Main Inlet valve | - | 4 Nos., Butterfly type |
| Diameter | m | 4.30 |

General Manager

महाप्रबंधक
 डुगर जल विद्युत परियोजना
 Dugar Hydro Electric Project
 नगवाई, जिला मंडी (हिम.)-175121
 Nagwan, Distt. Mandi (H.P.)-175121

200

Detailed Project Report
Dugar Hydroelectric Project (500 MW)



Transformers for 103 MW machines

| | | |
|---------------|---------|----------|
| Location | --- | Indoor |
| Capacity | --- | 45 MVA |
| Voltage ratio | kV / kV | 13.8/400 |

Transformers for 44 MW auxiliary machines

| | | |
|---------------|---------|----------|
| Location | --- | Indoor |
| Capacity | --- | 45 MVA |
| Voltage ratio | kV / kV | 13.8/400 |

Tailrace Surge Cavern/Draft Tube gate operation chamber

| | | |
|-----------------------------------|---|---------------------------------|
| Type | - | Restricted orifice type |
| Size of tailrace surge chamber | m | 81.8 (L) x 10.8 (B) x 47.85 (H) |
| Bottom elevation of chamber | m | 2001.40 |
| Maximum upsurge level | m | 2028.70 |
| Minimum down surge level | m | 2005.20 |
| Nos. and size of draft tube gates | - | 04 Nos., 6.0m (W) x 7.7m (H) |
| Size of access tunnel | m | 5.0 (Diameter), D-shape |

Tailrace Tunnel

Main Plant

| | | |
|-----------------------------------|---|---------------|
| Nos. & Dia. of draft tube tunnels | - | 04 Nos., 7.7m |
| Length of each draft tube tunnel | m | 58 |

Detailed Project Report
Dugar Hydroelectric Project (500 MW)



Estimated cost

| | |
|--|------------------------------|
| Civil works (Including Pre-operative Works) | ₹ 2604.12 (in crores) |
| E&M works | ₹ 932.07 (in crores) |
| ATS COST | ₹ 205.35 (in crores) |
| Cost of Miscellaneous Works (Including indirect Charges) | ₹ 18.48 (in crores) |
| Total basic cost | ₹ 3760.02 (in crores) |
| IDC and financing charges | ₹ 666.18 (in crores) |
| Total Project cost | ₹ 4426.20 (in crores) |

Power benefits

Main plant (4 x 95 MW)

| | | |
|---|-----|---------|
| Annual energy (in 90% dependable year) | GWh | 1420.78 |
| Design energy (at 95% plant availability) | GWh | 1397.66 |

Auxiliary plant (2 x 34.5 MW)

| | | |
|---|-----|--------|
| Annual energy (in 90% dependable year) | GWh | 373.99 |
| Design energy with 95% plant availability | GWh | 361.32 |

Financial aspects

Tariff as per CERC

| | |
|--|------------|
| Cost of generation (1 st Year Tariff) per kWh at power house bus bars (including IDC) during 90% dependable year as per CERC Guidelines | ₹4.65 /kWh |
| Cost of generation (Average for first ten year Tariff) per kWh at power house bus bars (including IDC) during 90% dependable year as per CERC Guidelines | ₹3.2 /kWh |
| Cost of generation (Levellised Tariff) per | ₹4.62/kWh |

| | | |
|--|--|---|
|  <p>एन एच पी सी NHPC</p> <p>CIN:L40101HR19 75GOI032564</p> | <p>एनएचपीसी लिमिटेड (भारत सरकार का सूची 'ए' उद्यम) NHPC Limited (A Schedule 'A' Enterprise of Govt. of India)</p> <p>स्वच्छ भारत एक कदम सचित्रता की ओर</p>  <p><i>Digital India</i> Power To Empower</p> | <p>डुगर जल विद्युत परियोजना पार्बती परिसर, नगवाई, जिला मण्डी (हिंप्र०) 175121</p> <p>Dugar HE Project Parbati Complex, Nagwain, Distt.- Mandi (H.P.) 175121</p> <p>फोन/ Tel. 01905 280260 E-mail: dugarhep@gmail.com</p> |
|--|--|---|

UNDERTAKING

We undertake that the project shall provide the "Technical Concurrence and Implementation Agreement" once it is approved from Central Electricity Authority and Government of Himachal Pradesh respectively.

(Signature)
महाप्रबंधक
General Manager
डुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हिंप्र०) 175121
Nagwain, Distt. Mandi (H.P.) 175121
(प्राप्ति कांत)

महा प्रबंधक,
डुगर जल विद्युत परियोजना

207

OFFICE OF THE ASSISTANT DIRECTOR, ANIMAL HEALTH/BREEDING-CUM-CONTROLLING (FISHERIES IN PANGI VALLEY) PANGI AT KILLAR.

To

✓ The Site In-Charge,
Dugar Hydro Power Limited,
Killar Tehsil, Pangi Distt, Chmaba H.P.

Dated Killar the 27th March, 2015.
Sub:- Issue of No Objection Certificate for 449 MW Dugar Hydro Electric Project on River
Chenab at Vicinity Village Luj T ehsil, Pangi Distt. Chamba H.P.

Sir,
With Reference to your letter No.DHPL/SO/201512/12 Dated 12 January, 2015 on
the subject cited above.

In this context the No Objection Certificate in favour of M/S Dugar Hydro Power Limited, Killar Tehsil, Pangi Distt. Chmaba H.P. for the construction of 449 MW Dugar Hydro Electric Project on River Chenab at Vicinity Village Luj T ehsil, Pangi Distt. Chamba H.P. is being issued on the following terms and condition;

1. The Fishing licencing Authority rights will be reserved with the Department of Fisheries in the reservoir of the 449 MW Dugar Hydro Electric Project on River Chenab at Vicinity Village Luj T ehsil, Pangi Distt. Chamba H.P.
2. M/S Dugar Hydro Power Limited, Killar Tehsil, Pangi Distt. Chmaba H.P. will help in development of Fisheries in the reservoir of the 449 MW Dugar Hydro Electric Project on River Chenab at Vicinity Village Luj T ehsil, Pangi Distt. Chamba H.P.

(Signature)

Assistant Director, Animal Health/Breeding-cum-Controlling Officer,
(Fisheries in Pangi Valley) Pangi at Killar. Phone No. 01897-242226.

No. FSH-PNG/G(1)4/2014-
Dated Killar the 27th March, 2015.
Copy for Information to:
1. The Worthy Director-cum-Chief Warden of Fisheries, H.P. Billaspur H.P. for information please.
2. The Sub Division Officer (Civil) Sub Division, Pangi at Killar for information with reference to their letter No. SDK/PNG/2015-117-119 dated 12/01/2015 please.

(Signature)

Assistant Director, Animal Health/Breeding-cum-Controlling Officer,
(Fisheries in Pangi Valley) Pangi at Killar. Phone No. 01897-242226.


महाप्रबंधक
General Manager
दुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, सिलमण्डी (हिन्दू) - 175121
Nagwain, Distt. Mandi (H.P.)-175121

Himachal Pradesh
Public Works Department

No-PW-KD-CB-WA-NOC/2015-16

50-53

Dated 02/04/15

To

Dugar Hydro Power Limited,
C/o Statkraft Limited,
Block-A, Plot-A/II, 4 floor MGF Metropolitan Mall Saket Distt.
Center New Delhi-110017.

Subject: -

Request for issuance of no objection certificate for 449 MW
Dugar Hydro electric project in Chamba District of HP being
implemented by Dugar Hydro Power Limited, No objection
certificate.

Reference: -

Your office letter No. Dugar/Progress report/20140901-02 date
01-09-2014

With reference to approval conveyed by the Resident
Commissioner Pangi at Killar vide noting para 4 dated 15/11/2014, no objection certificate is
hereby issued in your favour in respect of Himachal Pradesh Irrigation & Public Health
Department (I&PH) with the following terms and conditions:-

1. The company has to restore all the existing water supply scheme, FIS & Irrigation
schemes or bear the expenditure for the same, which will get submerged in the reservoir
after construction of the project.


Executive Engineer,
Killar Division HP PWD,
Killar (Pangi) SHP PWD
Killar (Pangi)

Copy forwarded to The Resident Commissioner Pangi at Killar for
information and necessary action with reference to noting Para 4 approved dated
15/11/2014.

Copy forwarded to Assistant Engineer I&PH Sub-Division Killar for
Information and necessary action.

Copy to Drawing Branch of this office for information.


Executive Engineer,
Killar Division HP PWD,
Killar (Pangi)


महाप्रबंधक
General Manager
डुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हिम.)-175121
Nagwain, Dist. Mandi (H.P.)-175121

"Annexure - XVII"

Himachal Pradesh
Public Works Department

No-PW-KD-CB-WA-NOC/2015-16

To

46-49

Dated 02/05/15

Dugar Hydro Power Limited,
C/o Statkraft Limited,
Block-A, Plot- AII, 4 floor MGF Metropolitan Mall Saket Distt.
Center New Delhi-110017.

Subject: -

Request for issuance of no objection certificate for 449 MW
Dugar Hydro electric project in Chamba District of HP being
implemented by Dugar Hydro Power Limited, No objection
certificate.

Reference: -

Your office letter No. Dugar/Progress report/20140901-02 dated
01-09-2014

With reference to approval conveyed by the Resident
Commissioner Pangi at Killar vide noting para 4 dated 15/11/2014, no objection certificate is
hereby issued in your favour in respect of Himachal Pradesh Public Works Department with the
following terms and conditions:-

1. The company has to realign/reconstruct or bear the expenditure for construction of road portion of Punto road (if any) which will be get submerged in the reservoir after project construction.
2. 87 mtrs span existing Stiffened suspension bridge which will be submerged in the reservoir is to be reconstructed or bear the expenditure for the same before starting the work of dam.
3. All existing foot paths/roads on both banks of river area affected by the DHPL are to be constructed/re-aligned or bear all expenditure to restore the affected schemes.
4. All the PWD infrastructure affected by the construction of DHPL will be reconstructed or bear the expenditure for all affected infrastructure before starting the construction of the project.


Executive Engineer,
Executive Engineer,
Killar Division HP PWD,
Killar (Pangi) 15/11/2014

Copy forwarded to The Resident Commissioner Pangi at Killar for
information and necessary action with reference to noting Para 4 approved dated
15/11/2014.

Copy forwarded to Assistant Engineer HP PWD Sub Division No-1
Killar for information and necessary action.

Copy to Drawing Branch of this office for information.


Executive Engineer,
Killar Division HP PWD,
Killar (Pangi)


महाप्रबंधक
General Manager
दुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हि.प्र.)-175121
Nagwain, Distt. Mandi (H.P.)-175121

F. No. 22(07)/2016/D(Coord)
 Bharat Sarkar/ Government of India
 Raksha Mantralaya/ Ministry of Defence

Room No. 4, South Block
 New Delhi, dated the 18th November, 2020

OFFICE MEMORANDUM

Subject:-Grant of NOC/ Defence Clearance from Ministry of Defence in respect of Dugar Hydro Project(449 MW) located in Chamba District of Himachal Pradesh-reg.

The undersigned is directed to refer to the Ministry of Power's DO letter No. 2/6/2019-NHPC dated 15th September, 2020 on the above subject and to inform that Ministry of Defence has no objection for construction of Dugar Hydro Power Project(449 MW) in Chamba District of Himachal Pradesh by M/s NHPC Limited provided there is no change in the configuration of the project (like Coordinates & Height etc.) and all the terms and conditions stipulated in the NOC granted earlier to M/s Dugar Hydro Power Limited vide Ministry of Defence Office Memorandum of even number dated 11.05.2017 is fulfilled.

2. This NOC shall be valid till 10.05.2024 and should be read with Ministry of Defence Office Memorandum of even number dated 11.05.2017.



(B B Patel)

Director (Coord)

Tele: 2301 2729

To,

Ministry of Power,
 (Kind Attn. Shri Tanmay Kumar, Joint Secretary)
 Shram Shakti Bhawan, New Delhi.

Copy to:-

 ✓ (i) Shri M K Goel, Executive Director, M/s NHPC Ltd., NHPC office complex, Sector-33, Faridabad, Haryana-121003.

(ii) Shri Pramod K Shrivastava, Project Director, M/s Dugar Hydro Power Ltd., C/o Statkraft, 403, 4th Floor, Salcon Rasvillas Building, Saket District Centre, Delhi-110017

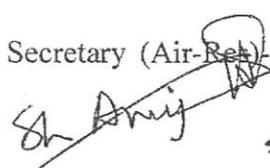

 महाप्रबंधक
 General Manager
 डुगर जल विद्युत बोर्ड
 Dugar Hydro Power Project
 नगरावाहि नियंत्रण बोर्ड
 Nagravahi Niyantran Board
 175121

Copy also to:-

(i) Section Officer (N-II/Ops)- w.r.t. MOD ID No. 5(5)/2015-D(N-II/Ops(495-Vol.IV) dated 25.11.2016

(ii) Under Secretary (GS-III)-w.r.t. MOD ID No. 23/01/2016-D (GS-III), dated 08.03.2017

(iii) Under Secretary (Air-Rec)-w.r.t. MOD ID No. 3(11)/2016-D(Air-II), dated 30.03.2017.


 Shri Anil

Sh. Lawania, SMCC



No..... 2759,

Himachal Pradesh Forest Department,
Dated Chamba, the..... 17-12-2020

From: Divisional Forest Officer,
Wildlife Division Chamba, H.P.

To: General Manager,
Dugar HE Project,
Parbati Complex, Nagwain, Distt. Mandi (H.P.)-175121

Sub: No Objection Certificate for implementation of Dugar HE Project (449 MW) in favour of NHPC Ltd.

Sir/Madam,

Please refer to your office letter no. NH/DHEP/HOP/FC/2020-21/83 dated 27/10/2020 & the .kml file received on the official e-mail id of the undersigned on dated 16/11/2020 on the subject cited above. It is a revised and in continuation to this office letter no. 2351 dated 13/11/2020 after receiving .kml file.

2. After going through the proposal, it has been observed that the nearest distance of the nearest component of power house of the proposed Hydro Electric Project is at the aerial distance of 19.98 KM (approx.) from the proposed Eco-sensitive Zone of nearest Wildlife Sanctuary i.e. Sechu-Iwan Nalla.

This is for your information and necessary action.

016
D
Divisional Forest Officer
Pangi Forest Division
KILLAR

Divisional Forest Officer
Wildlife Division Chamba
dflowchambade@gmail.com
Ph/Fax: 01899-222619

D. B. D. B.
Divisional Forest Officer
Pangi Forest Division
Killar 176323

महाराजांक (दिल्ली) नियंत्रित
पर्यावरण विभाग / राज्य-11
पर्यावरण विभाग / राज्य-11
दिल्ली
दिल्ली

Reg d

209

NO:Ind/Bhu/Chamba/ Misc- 449
Office of the Mining Officer, Chamba
District Chamba (H.P)

Chamba

Dated: 28-10-2020

To

The General Manager
Dugar HE Project (NHPC)
Parbati Complex P.O. Nagwan
Distt. Mandi (H.P)

Sub: Regarding NOC for Dugar HE Project, Tehsil Pangi Distt. Chamba.

Sir,

In reference to your office letter no. NH/DHEP/HOP-02/2020-21-120-22 dated 25.7.2020 on the subject cited above.

In this context, it is submitted that this office have no objection regarding mining activities in the mentioned area during the construction of Dugar HE Project (449 MW) at Tehsil Pangi District Chamba except the area having Kh.no. 266/1 measuring to 1-10-00 bighas in Mohal/Mauza Sach in Tehsil Pangi, which have already been auctioned by the department for collection of minor mineral to meet out the requirement of development activities in sub division.



Mining Officer
District Chamba (H.P)


महाप्रबंधक
General Manager
डुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हिम.)-175121
Nagwan, Distt. Mandi (H.P)-175121

अधीक्षण पुरातत्त्वविद
भारतीय पुरातत्त्व सर्वेक्षण
शिमला मंडल शिमला-१७१००७
हिमाचल प्रदेश
दूरध्वास: ०१७७.२६५.०५८८
टेली फैक्स: ०१७७.२६५.९९७०
ई-मेल: circleshi.asi@gmail.com



Superintending Archaeologist
Archaeological Survey of India
Shimla Circle, Shimla-171001
Himachal Pradesh
Phone: 0177-265-0584;
Tele-fax: 0177-265-1170
E-mail: circleshi.asi@gmail.com

File no: 7-50 / स्मारक / समा.पत्रात्र / 2020-21 - ५२७

Date: 27/07/2020

सेवा में,

महा प्रबंधक,
डुगर जल विद्युत परियोजना,
पार्वती परिसर, नगवाई,
जिला मण्डी-175121 (हि.प्र.)

27 JUL 2020

विषय:— डुगर जल विद्युत परियोजना के ढूब क्षेत्र में स्थित पुरातात्त्विक स्थल की जानकारी प्रदान करने के संबंध में।

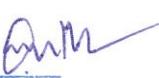
महोदय,

उपरोक्त विषय के संबंध आपके पत्र संख्या: एनएच / शीएचईपी / एचओपी-02 / 2020-21/23-25, दिनांक 25/07/2020 के संबंध में आपको सूचित किया जाता है कि पांगी घाटी में किलाड़ तहसील, जिला चम्बा में स्थित डुगर जल विद्युत परियोजना स्थल के अंतर्गत में कोई केन्द्रीय संरक्षित स्मारक तथा पुरातात्त्विक स्थल अवस्थित नहीं है।

पत्र आपकी जानकारी एवं आवश्यक कार्यवाही हेतु प्रेषित।

भवदीय,

अधीक्षण पुरातत्त्वविद (स्मारी)


महाप्रबंधक
General Manager
डुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हि.प्र.)-175121
Nagwain, Distt. Mandi (H.P.)-175121

CERTIFICATE

It is certified that as per the Govt. Notification, 1952 all waste lands are Forest Land. Hence no alternative Non Forest Land is available for the Compensatory Afforestation (C.A) of the project for diversion of forest land i.e. 449 MW for Dugar HEP.

DATED 6.6.2015

S. M.
Divisional Forest Officer
Divisional Forest Officer
Pangi Forest Division Killar
Pangi Killar

C/S.

U. B. Thakur
DEPUTY COMMISSIONER
CHAMBA, DISTT CHAMBA.

A. P. Lewis
Divisional Forest Officer
Pangi Forest Division
Killar 176323

S. P. S. S.
12/06/15

CERTIFICATE

It is certified that as per the Govt. Notification, 1952 all waste lands are Forest Land. Hence no alternative Non Forest Land is available for the implementation of the project for diversion of forest land i.e. 449 MW for Dugar HEP.

DATED 6.4.2015

5/5/2015
Divisional Forest Officer
Pangi Forest Division, Killar

Pangi Killar

4/5

Subrahmanian
DEPUTY COMMISSIONER
CHAMBA, Distt CHAMBA.

A. P. Lewis
Divisional Forest Officer
Pangi Forest Division
Killar 176323

Bh
12/locis

MUCK MANAGEMENT PLAN OF DUGAR HE PROJECT

The construction would involve about 3, 70,880 m³ of soil excavation and 9, 23,970 m³ of rock excavation. About 60% of rock excavation is expected to be used for producing coarse and fine aggregate for concrete production and in fillings for developing areas for construction facilities. Total quantity of excavation in common soil and balance quantity of rock excavation would have to be disposed in muck disposal areas. Thus considering swell factors 0.63 for rock and 0.80 for common soil as adopted from CWC Guidelines and redeposit compaction factor of 83%, total muck disposal area should have a capacity of about 8,71,706 m³. Keeping the above requirement, one muck disposal area (MDA-1) with total capacity more than 8.75 Lac m³ has been identified taking into consideration availability of suitable area, minimum distance from generation sites, safe distance from highest flood level (HFL) etc.

Prior to start of dumping activity, muck disposal area (MDA) will be protected with retaining structure to avoid any spillage of muck. After the completion of dumping activity, proper restoration plan with biological and engineering measures is required for restoration of the dumping area. A suitable restoration plan will be proposed under the EMP for muck dumping site(s).



महाप्रबंधक
General Manager
दुगर जल विद्युत परियोजना
Dugar Hydro Electric Project
नगवाई, जिला मण्डी (हिप्र)-175121
Nagwain, Distt. Mandi (H.P.)-175121

POWER TRANSMISSION OF DUGAR HE PROJECT

The following is proposed for power transmission of Dugar HE Project:

(i) Consent / Agreement signed between the Generating Company and Purchaser(s) (State utilities and other Buyers):

NHPC will approach various beneficiaries for the quantum of power they wish to draw from Dugar H.E. Project and signing of Purchase Power Agreement (PPA). The Energy generated from Dugar H.E. Project- 500MW (4X103MW Main units + 2X44MW Aux. units) would be available to prospective buyers on mutually agreed commercial terms and conditions between NHPC and buyers through the prevailing transmission systems.

(ii) Letter of consent from appropriate transmission utility to provide evacuation system:

As per para 7.1 & 7.2 of detailed procedures of CERC Regulation 2009 for grant of Connectivity, hydro generating station of 250 MW and above shall be taken into account for coordinated transmission planning by the CTU and CEA. Accordingly, NHPC approached to CEA and CTU for Power Evacuation System of Dugar H.E. Project and as directed by CEA, NHPC applied for Connectivity of Dugar H.E. Project to CTU as per CERC's Connectivity, LTA/MTOA Regulations 2009.

(iii) Details of existing and proposed system:

As per CEA letter no. I/11015/2020 (File no. CEA-PS-11-22(14)/1/2018-PSPA-1 Division dated: 21.08.2020 (Copy enclosed) number of other Projects like Purthi (224MW), Reoli Dogli (458MW), Bardang (167MW), Seli (400MW) and Miyari (130MW) under different Project Developers have been envisaged in the Chenab Basin in Himachal Pradesh for almost same timeframe of 2029-2030 as Dugar H.E. Project. In order to evacuate the Power from these Projects including Dugar H.E. Project, a 400/220 KV Substation under ISTS would be constructed somewhere between Dugar and Purthi. Power from the Projects in the Chenab Basin would be pooled at this 400/220KV Substation. From this Pooling Station power would be taken to the nearest ISTS point through 400KV Quad D/C line.

For evacuation of Power, the Project Developer has to make a provision for either LILO of the nearest ISTS 400KV line to their Pothead Yard with a provision to handle current of 4KA and provision for 2 nos. of 400KV line bays or construct a dedicated 400KV D/C line



भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली योजना एवं मूल्यांकन-। प्रभाग

Power System Planning & Appraisal-I Division

संवाद में/To,

General Manager,
 T&RE Division, NHPC office complex, Sector-33,
 Faridabad, Haryana-121003

विषय/Subject: Power Evacuation system for Dugar H. E. Project (449 MW)-reg.

Sir,

This has reference to the NHPC letter no NH/T&RE/2020/143-44 dated 13.7.2020 vide which NHPC has requested CEA to provide the evacuation system for Dugar HEP located in the Chenab Basin, near Killar Village in Chamba district.

In this regard, it is mentioned that number of projects such as Dugar(449MW) of NHPC, Purthi(224MW), Reoli Dogli (458MW) and Bardang(167 MW) of SJVNL and Seli(400MW) and Miyar(130MW) of NTPC have been envisaged in the Chenab Basin in Himachal Pradesh for the timeframe of 2029-30. In order to evacuate the power from these projects, a 400/220kV Substation under ISTS would be constructed somewhere between Dugar and Purthi. Power from the projects in the Chenab basin would be pooled at this 400/220kV substation. From Dugar/Purthi pooling station power would be taken to the nearest ISTS point through 400 kV Quad D/C line.

For evacuation of power, the project developer has to make a provision for either LILO of the nearest ISTS 400 kV line to their Pothead Yard with a provision to handle current of 4 KA and provision for 2 nos. of 400 kV line bays or construct a dedicated 400 kV D/C line (about 25 kms.) with Moose conductor from the hydro project to the 400/220kV pooling station along with 2 nos. of 400 kV line bays at both ends. The above connectivity proposal is tentative and would be firmed up after grant of Connectivity/LTA by CTU.

भवदीय / Yours faithfully

Signature Not Verified

Digitally signed by MANDARI

CHATURVEDI

Date: 2020.08.21 16:00:27 IST

(मंजरी चतुर्वदी/Manjari Chaturvedi)

निदेशक/ Director

Copy to: Shri Mukesh Khanna CGM, POWERGRID/CTU, Saudamini, Plot No.2, Sector 29, Near IFFCO Chowk, Gurgaon (Haryana) - 122001, INDIA

महाप्रबंधक

General Manager

दुगर जल विद्युत परियोजना

Dugar Hydro Electric Project

नगवाई, जिला मण्डी (हिम.)-175121

Nagwain, Distt. Mandi (H.P.)-175121

Joint Inspection Report

The team comprising of DFO, Pangi SDM, Pangi and General Manager Dugar HE Project has inspected the proposed site for the construction of Dugar HE Project on 08.10.2021.. and examined alternative with view to avoid / minimize the use of forest land. The joint inspection team have come to the conclusion that the proposed Forest land measuring 211.84 ha in Pangi Forest Division comprising of Khasra No. as per details given below is absolutely essential and the land required for the project is the minimum.

| S. No. | Name of the Forest | Khasra No. | Area in ha. |
|--------|--------------------|--|---------------|
| 1 | Findpar | 259/1, 424/1 | 2.4 |
| 2 | Kagal | 2/1, 3/1, 4, 5/1 | 15.95 |
| 3 | R F Punto | 1/1, 5/1, 26/1, 27, 28, 29/1 | 6.9 |
| 4 | Punto | 321/1, 351, 459/399/1, 352/1 | 5.5 |
| 5 | R F Kalatop | 1, 2, 3/1, 4/1, 5, 6/1, 8/1 | 25.8 |
| 6 | R F Chilkot | 2/1, 2/2, 2/3, 2/4, 12/3/1, 13/3/1, 13/3/2, 13/3/3, 13/3/4, 13/3/5, 13/3/6, 13/3/7, 13/3/8, 13/3/9, 13/3/10, 13/3/11, 13/3/12, 1/1, 15/3, 16/7, 17/7, 18/7, 8/1 | 35.59 |
| 7 | R F Luj | 5/1/1, 5/1/2, 5/1/3, 5/1/4, 5/1/5, 5/1/6, 5/1/7 | 13.09 |
| 8 | Luj | 702/577/1, 702/577/2, 752/694/1, 752/694/2, 752/694/3, 752/694/4, 288/1, 748/293/1, 748/293/2, 748/293/3, 748/293/4, 748/293/5, 748/293/6, 748/293/7, 748/293/8, 294/1 | 12.02 |
| 9 | Dharwas | 524/12/1 | 0.31 |
| 10 | R F Kanyun | 3/1, 3/2, 3/3, 3/4, 3/5, 4/1, 7/1/1, 7/1/2, 7/1/3, 7/1/4, 7/1/5, 10/2/1, 10/2/2, 7/1/6, 7/1/7, 7/1/8, 7/1/9, 8/1/1 | 18.3 |
| 11 | R F Urnu | 1/1, 8/3/1, 9/3/1 | 3.42 |
| 12 | Ghangeet | 357/1/1, 372/37, 373/37, 361/38/1, 413/362/1, 307, 369/308/1, 361/38/2, 361/38/3, 368/308/1, 369/308/2, 371/38 | 22.32 |
| 13 | Paragwal | 699/28/1, 707/578/1, 587/179/1, 722/431/1, 540/1, 540/2, 541, 542/1, 542/2, 547/1, 548/1, 549/1 | 14.52 |
| 14 | Karel | 2/1, 2/2, 3, 4/1, 4/2, 237/219/1, 220/1, 221/1, 222, 223 | 15.72 |
| 15 | R F Chatwani | 17/7/1, 26/11/1, 13/1, 14, 15, | 8.7 |
| 16 | Chacherwas | 194/179/1, 181/1, 182/1 | 11.3 |
| | | Total | 211.84 |

In view of above the Joint Inspection team has come to the conclusion that the proposed Forest land is absolutely appropriate for the construction of Dugar HE Project and the land required / identified is barest minimum. The revenue record showing the area proposed for diversion for non-forest uses are enclosed with the joint inspection report.


Divisional Forest Officer
Pangi Forest Division, Killar


SDM
Pangi at Killar


General Manager
Dugar HE Project

